Hydrogeologic Investigation

Phil's Auto Site
701 ISLETA BLVD., SW

ALBUQUERQUE, BERNALILLO COUNTY, NM

May 15, 2001

Prepared For:

Bernalillo County Environmental Health Department
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HYDROGEOLOGIC INVESTIGATION REPORT

PHIL'S AUTO SITE

701 ISLETA BLVD.,SW
ALBUQUERQUE, NEW MEXICO

FAITH ENGINEERING, INC.

TECUMSEH PROFESSIONAL ASSOCIATES, INC.

MAY 15, 2001

Submitted to:

Mr. Nolan Bennett
Environmental Health Scientist
Bernalillo County Environmental
Health Department

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1.0 EXECUTIVE SUMMARY

On behalf of the Bernalillo County Environmental Heath Department (BCEHD), Faith Engineering, Inc. (FEI) and Tecumseh Professional Associates, Inc. (TPA) performed a Hydrogeologic Investigation (HI) at the Phil's Auto Site (the Site) located at 701 Isleta Blvd., SW in Albuquerque, New Mexico (Figure 1). The HI was performed to evaluate hydrocarbon releases first discovered in the site vicinity in July 1987 when hydrocarbon odors were reported in a nearby private water well (Figure 2). The Site is located approximately three quarters of a mile south of the intersection of Bridge Blvd. and Highway 314 (Isleta Blvd.). Land use in the immediate area is a mixture of light commercial and residential (Figure 2).

The Site was used to dispense fuel for several decades. Three underground storage tanks (USTs) containing gasoline were formerly located along the northern side of the property (Figure 2). Analysis of inventory records indicate a cumulative loss of over 8,500 gallons from unleaded and regular UST systems. The tanks were removed from the ground in October 1993.

Resources Technology, Inc. (RTI) was retained by the responsible party in 1990 to conduct a site investigation. RTI installed and sampled three new monitor wells at the Site (MW-1, MW-2, and MW-3) and advanced temporary soil gas/groundwater sampling points at 10 additional locations to the south and the west of the Site. In 1993 under contract with the New Mexico Environment Department, Underground Storage Tank Bureau (NMED/USTB), Gram and Associates, Inc. (Gram) conducted site investigation activities as part of the Ground Water Protection Act (GWPA) State Lead program. During these activities seven new monitor wells were installed and five boreholes were advanced and sampled at the Site. In 1994, Intera, Inc. (Intera) was retained by NMED/USTB to design and install a remediation system. Intera submitted a reclamation proposal to NMED/USTB in April of 1994 for the installation of a SVVS^{TM} in-situ reclamation system. As part of the reclamation design, Intera conducted a short-term pilot test on a combination sparge/vent well cluster located in the northern portion of the Site. An in-situ SVVS ^{TM} remediation system was installed at the Site in 1995 (Figure 3). The system reportedly operated between September 1995 and early 1996 when it was shut down.

The objective of FEI/TPA's HI was to better characterize the current subsurface hydrogeologic regime and the vertical and horizontal extent of soil and groundwater impacts at the Site following remedial efforts. The HI included four primary tasks: 1) review of NMED/USTB files, site mapping and photography, and review of historic soil and groundwater data, 2) re-sampling

and analysis of groundwater from previously installed monitor wells with an additional 3 quarters of ground water monitoring, 3) advancement and sampling of new soil borings and monitor wells; and 4) completion of this summary HI Report.

Initial FEI/TPA groundwater sampling for the 1st quarter of monitoring took place on September 18, 2000. TPA drilling activities took place at the Site between October 13, 2000 and February 2, 2001. A total of 17 boreholes were advanced in the Site vicinity. Five were completed as monitor wells (Figure 2), one was completed as a groundwater flow sensor, and the remainder were plugged and abandoned with bentonite-cement grout and native material to the land surface. Final groundwater sampling took place on January 30, 2001 and February 16, 2001.

Retrieved samples collected from boreholes indicate soils between the ground surface and approximately 18 feet below surface grade (bsg) can be subdivided into 2 primary laterally extensive Lithologic Units (Figure 4). Lithologic Unit I extends from the ground surface to approximately 4-6 feet bsg and is comprised primarily of well sorted fine to medium grained silty sands, very fine to fine grained silty clayey sands, and lesser amounts of sandy silty clays and clays. Horizontal facies changes in this unit are common. Lithologic Unit II extends from the base of Lithologic Unit I to approximately 19+ feet bsg and is composed primarily of poorly sorted sands ranging in size from fine to coarse grained with some gravel and some cobbles. The overall trend at the Site is a gradual coarsening downwards sequence.

During the Investigation, groundwater saturated conditions were generally encountered at a depths of approximately 12-13 feet bsg. Evaluation of groundwater level measurements indicates the potentiometric surface sloped to the west-southwest at a gradient of approximately 0.0006 feet/foot on January 30, 2001 (Figure 5).

Gasoline hydrocarbon impacts to soils in the immediate vicinity of the Site were found in an area limited to the vicinity of the former UST hold and dispensing system (Figures 4 and 6). Total petroleum hydrocarbon $(TPH)_{gasoline\ range}$ levels in retrieved soil samples were measured at concentrations of up to 760 parts per million (ppm) and $TPH_{kerosene(+)\ range}$ levels in retrieved soil samples were measured at concentrations up to 963 ppm. Chromatographic analysis indicate the majority of soil hydrocarbons in the Site vicinity are in the C_6-C_{14} carbon ranges which correlate with weathered gasoline and possibly kerosene fuel. Based on our knowledge of past site activities, it is likely that the primary hydrocarbon fuel at the Site is gasoline which has been weathered by natural attenuation and operation of the remediation system. Total ionizable volatile compounds (TIVC) headspace concentrations exceeded 10,000 parts per million/volume (ppm/v) and $TPH_{gasoline/diesel\ range}$ concentrations exceeded 100 ppm in the vicinity of boring B-1.

Groundwater impacts at the Site are characterized by low to trace concentrations of dissolved-phase benzene, toluene, ethylbenzene, and total xylenes (BTEX). Moderate to low concentrations of tri-methylbenzenes (TMBs) are present in select wells with low to trace concentrations of naphthalene (Figure 7). Groundwater sample data from monitor wells indicate that concentrations for all contaminants of concern are below New Mexico Water Quality Control Commission (NMWCC) or New Mexico Underground Storage Tank Regulation (NMUSTR) Standards with the exception of the naphthalene concentration in MW-1, 35 ppb. The majority of BTEX and TPH compounds appear to have been removed from the Site by the in-situ SVVS^{TM} system, natural biodegradation and dispersion processes.

Inorganic groundwater quality is relatively the same across the Site, and is dominated by the presence of moderate levels of bicarbonate. Sulfide, nitrate, and phosphate are present in very low to non-detect concentrations and pH ranged from 6.6 to 7.47.

An estimated 45 cubic yards of hydrocarbon contaminated soil is present in the Site vicinity. However, residual TPH spill mass estimates suggest that only approximately 30 gallons of TPH is still present in the immediate Site vicinity (see Appendix D).

The vertical and horizontal extent of soil and groundwater hydrocarbons has been defined. Based on existing data, there are no groundwater contaminants of concern currently exceeding WQCC or NMUSTR standards. Soil TPH levels exceeding NMUSTR standards are restricted to the immediate vicinity of B-1. Soil TIVC levels exceeding 1000 ppm/v are apparently restricted to an area extending between B-1 and B-8. FEI/TPA recommends a Tier Two risk assessment be performed at the Site and continued quarterly groundwater monitoring be implemented to document the continued degradation of remaining groundwater hydrocarbons. Operation of the existing SVVS^{TM} remediation system for an additional one to two quarters would remove the remaining soil impacts at the Site.

2.0 INTRODUCTION

2.1 BACKGROUND/SITE HISTORY

The Phil's Auto Site is located at 701 Isleta Blvd., SW (the west side of US Highway 314) in Albuquerque, New Mexico, and is highlighted in the site basemap shown in Figure 2. Surrounding properties include a small electronics repair shop to the south and residential housing to the north, west and east.

According to available records, the Site has been the location of a fueling station owned and operated by Mr. Phil Moya . Three underground storage tanks (USTs) were located at the Site north of the existing building, one containing unleaded and two containing regular gasoline (Figure 2) (RTI, 1990). Hydrocarbon releases were first identified at the Site in July of 1987. Analysis of inventory records indicate a cumulative loss of over 8,500 gallons from unleaded and regular UST systems. The tanks were removed from the ground in October 1993.

Resources Technology, Inc. (RTI) was retained by the responsible party in 1990 to conduct a site investigation. RTI installed and sampled three monitor wells at the Site (MW-1, MW-2, and MW-3) and advanced temporary soil gas/groundwater sampling points at 10 additional locations to the south and the west of the Site. No TPH soil samples were collected during the investigation. Data collected during the investigation did indicate the presence of soil and groundwater BTEX contaminants extending south and southwest of the station.

In 1993 under contract with the NMED/USTB Gram conducted site investigation activities as part of the GWPA State Lead program. Gram's investigation activities consisted of advancing and sampling twelve borings of which seven were completed as monitor wells. During advancement of these borings TPH soil data was not collected from any borehole and none of the borings were advanced in the former tank hold. LNAPLs were identified and measured to be as much as five inches in monitor wells MW-1, MW-2, MW-4, and MW-5. During the Gram investigation, laboratory soil samples were collected above the air-water interface in the soil borings, which were above the primary zone of contamination at the Site. However, as a result of this investigation, the soil and groundwater BTEX plume was confirmed to be trending south-southwest.

In 1994, Intera, was retained by NMED/USTB to design and install a remediation system. Intera submitted a reclamation proposal to NMED/USTB in April of 1994 for the installation of a

SVVS™ in-situ reclamation system. Intera conducted a short-term pilot test on a combination sparge/vent well cluster located in the northern portion of the Site. Induced flows of up to 60 standard cubic feet per minute (scfm) were reported at a vacuum of 4 inches of water indicating a highly transmissive subsurface environment. Sparging was also initiated at a reported rate of 23 scfm at approximately 4.7 psi. Intera calculated the radius of influence for the vapor extraction well to be greater than 20 feet. An in-situ SVVS™ remediation system was installed at the Site in 1995 and began operation in September of 1995. The reclamation system consisted of 33 sparge and vent well nests manifolded with underground PVC piping to an above ground treatment unit (Figure 3). Wells were constructed with 2" diameter, schedule 40 PVC with crushed stone surrounding the vent wells and 10/20 silica sand surrounding the sparge wells. Bentonite seals were emplaced to separate screened intervals and the land surface. The treatment unit consists of a 300 scfm catalytic oxidizer and vent and sparge blowers. The system operated between September 1995 and early 1996 when it was shut down.

2.2 SCOPE OF WORK

FEI/TPA's initial scope of work for the project consisted of four primary tasks:

- Review NMED/USTB files, site mapping, photography, and historic groundwater and soil data.
- Assess current Site conditions, sample existing monitor wells and conduct three additional quarters of sampling.
- Advance and sample soil borings and monitor wells in the Site vicinity to identify the magnitude and extent of soil and groundwater hydrocarbon impacts and better evaluate site hydrogeology.
- Analyze collected data and prepare and submit a Hydrogeologic Investigation (HI) Report pursuant to the USTR Part XII, Section 1212.

3.0 PHYSICAL SETTING

3.1 PHYSIOGRAPHY

The Phil's Auto property is approximately .5 acres in size, and is located at an average elevation of approximately 4,928 feet above mean sea level. Regional topography slopes toward the Rio Grande River, which is located approximately 2000 feet to the east of the Site (Figure 1). Locally, runoff from the Site drains to the west and south.

3.2 GEOLOGIC SETTING

3.2.1 Regional Geology

The Site rests on Quaternary fluvial sediments deposited by the nearby Rio Grande. Underlying the Site are poorly to moderately consolidated sedimentary rocks of the Tertiary Santa Fe Group (Kelly, 1977). During this investigation, only the uppermost Quaternary fluvial unit was encountered.

3.2.2 Site Geology

During the Investigation, a total of 17 soil borings were advanced in the Site vicinity to depths between 14-19 feet bsg at the locations shown in Figure 2. Five of these borings were completed as monitor wells and 1 as a flow sensor. Hollow-stem auger (HSA) drilling techniques were used to advance and sample each borehole. Site geology as observed in retrieved split-spoon samples and soil cuttings can be subdivided into two primary lithologic units based on grain size and areal extent. Although facies changes were observed during drilling activities, each of these primary stratigraphic units was found to be in general laterally persistent across the Site. To better illustrate site geology, TPA constructed the simplified geologic cross section shown in Figure 4 for the locations A-A'. Borehole lithologic logs are presented in Appendix A.

Lithologic Unit I extends from the ground surface to approximately 4-6 feet bsg and is comprised primarily of well sorted fine to medium sands, silty sands, and clayey silty sands with lesser amounts of clayey sands and clays. Sediments containing clay in this interval often exhibit low to moderate plasticity. Lithologic Unit I is typically finer grained and less permeable in nature than underlying sediments.

The contact between Lithologic Unit I and II is generally gradational in nature over a 1 to 2-foot interval. Lithologic Unit II extends from the base of Lithologic Unit I to approximately 19+ feet bsg (deepest borehole advanced at the Site). This Unit is composed primarily of fine to coarse sands with lesser amounts of gravels. Lithologic Unit II is typically gradational in nature and coarsens downward.

Horizontal facies changes are common in both Lithologic Units I and II. Soils encountered during the HI drilling appeared to have been deposited by fluvial processes associated with the nearby Rio Grande and represent a combination of axial channel deposits and over-bank deposits. In the Site vicinity, all borings advanced encountered sediments coarsening downwards.

3.3 HYDROGEOLOGIC SETTING

Groundwater was encountered in the Site vicinity at a depth of approximately 12-13 feet. Groundwater is typically encountered 7-8 feet below or at the contact between Lithologic Units I and II (Figure 4) and is unconfined in nature. Based on early groundwater sampling efforts at the Site, the aquifer is of high yield. Newly installed FEI/TPA wells recharged quickly during sampling. The new wells were screened across the water table using standard well construction techniques.

Groundwater level measurements in Site vicinity monitor wells are summarized in Table 1. Analysis of groundwater level data collected on September 14, 2000 and January 30, 2001 suggests the groundwater potentiometric surface slopes to the west-southwest at a gradient of approximately 0.0006 feet/foot (Figure 5).

4.0 FIELD AND LABORATORY SAMPLING METHODS AND PROCEDURES

4.1 GENERAL

This section describes the methods and procedures for the following project activities:

- Soil Boring and Monitor Well Installation
- Subsurface Soil Sampling and Analysis
- Groundwater Sampling and Analysis

As per the requirements of CFR 1910.120, FEI/TPA prepared a site specific Health and Safety Plan prior to initiation of field activities at the Site. A copy of the Health and Safety Plan is presented in Appendix C.

4.2 SOIL BORING AND MONITOR WELL INSTALLATION

Seventeen soil borings were advanced in the Site vicinity between October 13, 2000 and February 2, 2001 using a CME-75 hollow-stem auger (HSA) drill rig supplied and operated by Rodgers Drilling, Inc. or by a small truck-mounted low-mast rig operated by NEVEX, Inc. Following advancement, all soil borings not completed as monitor wells were abandoned by backfilling with approximately 3-5 feet of activated bentonite pellets, clean drill cuttings and the appropriate matching surface material at the land surface. Borehole lithologic logs and monitor well completion diagrams are located in Appendix A. Five of the seventeen boreholes were completed as 2-inch diameter PVC monitor wells. Each well was completed with 10 feet of schedule 40, 0.01 slot standard high flow PVC well screen. A 10-20 silica sandpack was emplaced from the base of the borehole to approximately one to two feet above the top of the well screen followed by approximately 2-4 feet of bentonite pellets. Bentonite was hydrated in approximately one-foot lifts by adding water. A bentonite-cement grout was emplaced from the top of the seal to just below the land surface followed by a standard 8-inch manway and concrete apron. A compression plug with lock was inserted in the top of each PVC well casing.

Sediment samples were collected from each borehole on a continuous basis using three-inch diameter, 5-foot long split-spoon core barrels or 2-foot long drive split spoons. Samplers were decontaminated between sample runs using an alconox solution followed by a tap water wash. All soil samples were described by a TPA Geologist or Engineer using the Unified Soil Classification System (USCS) logging methodology. Drill cuttings and rig activity were also

observed to identify lithologic contacts. Drill cuttings have been temporarily stored on-site on visquene plastic awaiting proper disposal.

4.3 SOIL SAMPLING AND ANALYSIS

During drilling activities, retrieved sediment samples were collected from the boreholes and analyzed in the field for total ionizable volatile compounds (TIVC) using a RAE-2000 Model photoionization detector (PID) utilizing a 10.6 eV lamp. 100 parts per million/volume (ppm/v) isobutylene span gas and ambient air were used to calibrate the PID prior to use.

Results of the field headspace and laboratory analyses are presented in Table 2 and Figure 6 and on the borehole logs presented in Appendix A. At each drilling location, discrete sediment samples were also collected using the USTR Methanol Extraction Method. These samples were hand delivered on ice to Pinnacle Laboratories Inc. (Pinnacle) for laboratory analyses. Laboratory soil samples were analyzed for the following parameters:

- Total Petroleum Hydrocarbons (C_6-C_{36} carbon range) (TPH $_{\text{gas-diesel range}}$) using EPA Method 8015 (modified) (GC-FID) – [Select samples, TPH $_{\text{diesel range}}$]
- Volatile Organic Compounds (VOCs) including BTEX, EDC, EDB, and MTBE using EPA Method 8260 (GC-MS)

During the Investigation, all soil samples were handled using strict Chain-of-Custody procedures. Laboratory reports including quality assurance/quality control data (QA/QC) and chain-of-custody documentation are presented in Appendix B.

4.4 GROUNDWATER SAMPLING AND ANALYSIS

Two separate groundwater sampling events were conducted in the Site Vicinity as part of the HI. On September 18, 2000, during the 1st quarterly monitoring event, groundwater samples were collected from eight previously installed monitor wells for laboratory analysis. On January 30, 2001 and February 16, 2001 following completion of HI drilling, groundwater samples were collected from five newly installed monitor wells. Groundwater laboratory analytical results are presented in Table 3 and Appendix B.

During each of the two sampling events, the water level in each well was measured and also gauged for the presence of LNAPL. Temperature, pH and conductivity measurements were taken during well purging to document in-situ water production. In order to purge and develop the monitor wells, between three to five well volumes were removed prior to collection of

groundwater samples using dedicated disposable bailers. Groundwater samples were collected and stored in appropriate containers using the appropriate preservatives. A blind duplicate was collected from one of the monitor wells for QA/QC purposes during the January 30, 2001 sampling event. Samples were collected using strict chain-of-custody procedures, stored on ice in a cooler, and hand-delivered to Pinnacle Laboratories, Inc. in Albuquerque, New Mexico. Purge water was discharged to an on-site paved surface to allow volatilization of any VOCs as per NMED guidance documentation.

Laboratory groundwater samples were analyzed for the following parameters:

- Volatile Organic Compounds (VOCs) including BTEX, EDC, EDB, tri-methyl benzenes (TMBs) and MTBE using EPA Method 8260 (GC-MS)
- 1,2 Dibromoethane (EDB) using EPA Method 504.1
- Electron receptors (SO_4, NO_3, Carbonates, and Fe_2) using CHEMets Colorimetric Test Kits

5.0 RESULTS OF THE INVESTIGATION

5.1 HYDROCARBON DISTRIBUTION IN SOIL

Table 2 presents a summary of laboratory analytical results for soil samples collected during subsurface drilling operations at the Site. In addition, the magnitude and extent of soil TIVC and TPH in cross-sectional view and soil TPH in plan view are presented in Figures 4 and 6. These data indicate that hydrocarbon releases in the Site vicinity are centered in the general vicinity of the former Phil's Auto UST systems. Off-site migration may have occurred in a west-southwest direction, but due to various access issues this could not be confirmed during this investigation (Figures 6 and 7). Based on drilling data, soil hydrocarbons exceeding TPH and/or TIVC levels may extend off-site to the west-southwest into the adjoining private property.

The TIVC soil headspace plume is approximately 170 by 190 feet across. A smaller adsorbed-phase TPH core of soil contamination is present and is approximately 20 by 30 feet in size. In general soil contaminants are restricted to a thin zone at and below the current water table (Figure 4). On-site soil hydrocarbons are in the weathered gasoline range with lesser amounts of diesel range constituents (Figure 6).

At present, soil hydrocarbons are characterized by below detection limit to low levels of gasoline range TPH and BTEX compounds with the exception of borehole B-1 located in the former UST tank pit. Maximum soil $TPH_{gasoline}$, $TPH_{kerosene}$, total BTEX and TMBs concentrations documented at the Site were 760 ppm, 963 ppm, 25.25 ppm, and 10.3 ppm, respectively.

Hydrocarbon saturated "highly contaminated" soils were not identified in the Site vicinity. Typically, sediments along or slightly below the potentiometric surface exhibited the greatest hydrocarbon impacts in borehole samples analyzed from the Site. TIVC levels exceeded 100 ppm/v in 7 of the 17 boreholes advanced in the Site vicinity. However most of these readings were less than 200 ppm/v. TIVC exceeded 1,000 ppm/v levels in only 1 of the soil borings (Figure 4).

Examination of soil laboratory data from samples collected from all drilling locations (Figure 4) indicate the absence of benzene and toluene; while trace amounts ethyl benzene, total xylenes, TMBs and naphthalene are still present. Chromatographic analysis indicates substantial weathering of soil hydrocarbons has occurred at the Site. SVVS^{TM} remedial activities appear to have resulted in removal of the majority of lighter end BTEX and TPH compounds from both

soils and groundwater.

5.2 HYDROCARBON DISTRIBUTION IN GROUNDWATER

Groundwater sampling data and chromatographic analysis suggest that remedial activities and natural biodegradation has stripped off lighter end BTEX components leaving only very low to trace amounts ethylbenzene, total xylenes and naphthalene. Presently, naphthalene is the only groundwater contaminant of concern above NMWQCC and NMUSTR standards. Table 3 and Figure 7 present detailed information on the distribution of hydrocarbon contaminants and inorganic ground water quality at the Site.

Trace to moderate levels of dissolved-phase ethylbenzene, total xylenes, TMBs and napthalene are present in select groundwater wells. Maximum ethylbenzene groundwater concentrations were measured at 120 ppb in MW-1. Maximum total xylenes groundwater concentrations were measured at 248 ppb in the same monitor well. Maximum TMBs groundwater concentrations were measured at 318 ppb in MW-10 and maximum naphthalene concentrations were measured at 35 ppb in MW-1.

Due to limited space between structures and private property access issues drilling the west-southwest edge of the groundwater plume was precluded. The horizontal extent of the groundwater plume is characterized at the Site with the exception of a small area west of FTW-4.

Inorganic water quality analyses of groundwater samples collected from pre-existing and newly installed wells are presented in Table 3. Groundwater inorganic chemistry is dominated by moderate levels of bicarbonate (HCO_3). Phosphate, sulfide, and nitrate concentrations in collected ground water samples were identified at trace levels or below analytical method detection limits. Total iron (Fe^2/Fe^3) concentrations ranged from a low of 0.1 ppm to a high of 5.0 ppm.

5.3 RESIDUAL SPILL MASS ESTIMATES

Preliminary estimates suggest that less than 100 gallons of gasoline and diesel are present as residual hydrocarbons in soils in the immediate vicinity of the Site. Calculations are presented in Appendix D, which includes Figure A, Residual Hydrocarbon Spill Mass Estimate Map.

6.0 CONCLUSIONS

Based on the data collected during the Hydrogeologic Investigation, the following conclusions are presented:

- Site geology as observed in retrieved soil samples can be subdivided into two primary laterally extensive lithologic units (Figure 4). Lithologic Unit I is silt-rich. Lithologic Unit II is sand-rich.

- One hydrocarbon source area was identified during the HI located on-site near B-1.

- During the Investigation, groundwater was first encountered at depths of between 10.5 and 13.5 feet bsg. Groundwater flow in the shallow aquifer was calculated to be west-southwest at a hydraulic gradient of approximately 0.0006 feet/foot.

- Residual gasoline hydrocarbon impacts are present in on-site soils in the vicinity of B-1 and are concentrated along or beneath the groundwater table.

- Analysis of laboratory chromatograms and hydrocarbon range breakdowns indicate the gasoline hydrocarbons identified at the Site are consistent with heavily weathered gasoline. Remediation activities have preferentially removed the lighter end TPH compounds from soils and groundwater at the Site.

- Calculations based on currently available data suggest approximately less than 100 gallons (600 lbs.) of residual hydrocarbons are present in soils in the Site vicinity. An unknown amount of TPH was removed during operation of the SVVS^{TM} system.

- The majority of residual TPH in soils and groundwater at the Site appear to be located with in the zone of influence of the original AS/VE remediation system.

- Groundwater hydrocarbon concentrations have decreased substantially over time and presently all but one contaminant of concern (naphthalene) are below NMWQCC and NMUSTR Standards.

7.0 RECOMMENDATIONS

Based on the information collected during this investigation and the requirements of the USTR Part XII, FEI/TPA recommend the following actions at the Site:

- Conduct a Tier Two RBCA evaluation to determine if any additional remedial efforts are necessary at the Site.

- Evaluate potential for operation of the SVVS^{TM} remediation system for one or two quarters to remove residual TPH, BTEX, and naphthalene from the Site.

- Continue quarterly groundwater monitoring at the Site to document plume stability and protect human health and the environment.

8.0 REFERENCES

Kelly, T.E., 1977; Geology of the Albuquerque Basin, New Mexico; New Mexico Bureau of Mines and Minerals Resources, Memoir 33.

RTI, 1990; Site Investigation for Phil's Auto Parts and Service.

Gram, 1993; On-Site Investigation for Phil's Auto Parts and Service.

Gram, 1993; Phase II Hydrogeological Investigation for Phil's Auto Parts and Service Groundwater Protection Act Site.

Intera, 1994; Reclamation Proposal, Phil's Auto Site

9.0 STATEMENT OF FAMILIARITY

We are personally familiar with the information presented in this report and it is accurate and complete to the best of our knowledge.

Faith Engineering, Inc.

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NMCS #80

Tecumseh Professional Associates, Inc.

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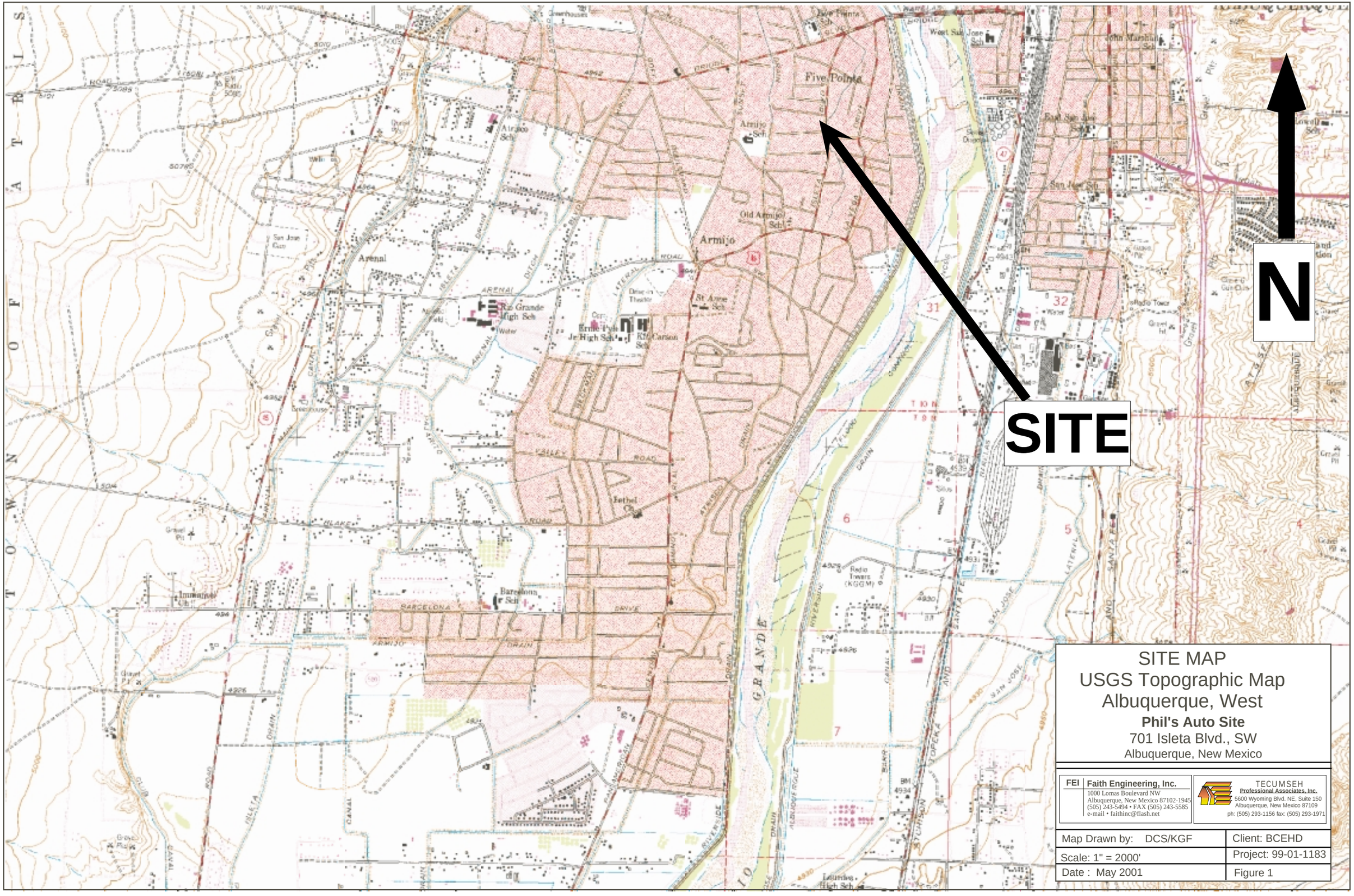
Senior Hydrogeologist
NMCS #77



SITE MAP
USGS Topographic Map
Albuquerque, West

Phil's Auto Site
701 Isleta Blvd., SW
Albuquerque, New Mexico

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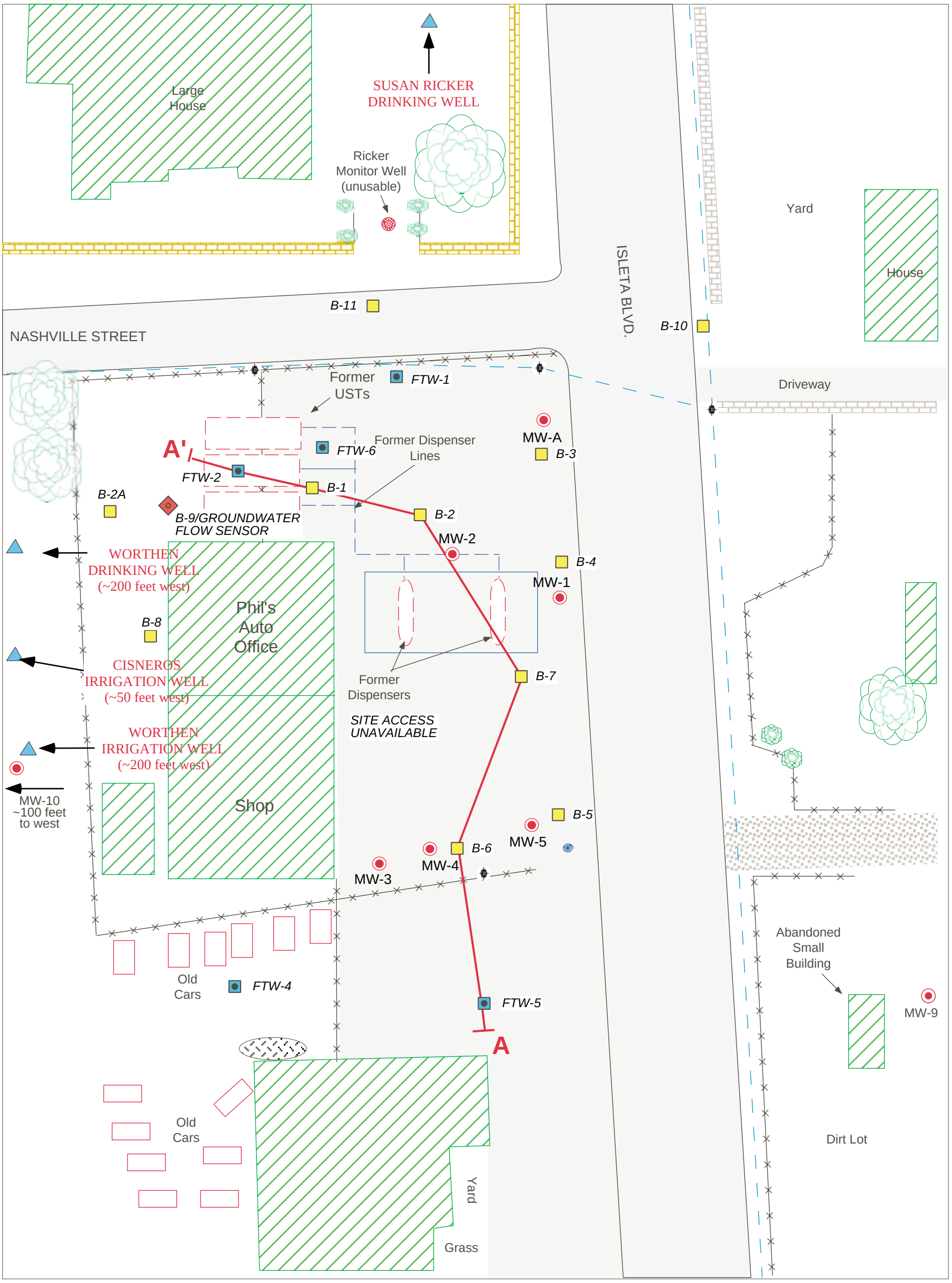
Map Drawn by: DCS/KGF	Client: BCEHD
Scale: 1" = 2000'	Project: 99-01-1183
Date : May 2001	Figure 1



EXPLANATION

- New 2" Diameter Monitor Well
- Existing Monitor Well Location
- New Soil Boring
- Private Water Supply Well
- Building
- Concrete
- Asphalt
- Vegetation
- Fence Line
- Utility Pole
- Manhole
- Fire Hydrant
- Adobe or Brick Wall

Utility Lines

- ug — Underground Gas Line
- uw — Underground Water Line
- ufbo — Underground Fiber Optics
- oe — Overhead Electric

A — A' Location Of Cross Section

N

0 15 30ft
Scale

SITE BASE MAP WITH CROSS SECTION LOCATION

Phil's Auto Site
701 Isleta Blvd. SW, Albuquerque, New Mexico

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Map Drawn by: WJB/SCG	Client: BCEHD
Base Drawn by: *ABL*/KGF/WJB	Project: 99-00-1183
Date : May 2001	Figure: 2

Large House

ISLETA BLVD.

NASHVILLE STREET

ABOVE GROUND RECLAMATION SYSTEM EQUIPMENT

Yard

House

Driveway

MW-A

PILOT TEST WELL CLUSTER

MW-2

MW-1

Phil's Auto Office

Shop

MW-10 ~100 feet to west

MW-5

MW-4

MW-3

Old Cars

Abandoned Small Building

MW-9

Old Cars

Yard

Grass

Dirt Lot

EXPLANATION

- Existing Monitor Well Location
- Well Control Box
- Subsurface Piping
- Previously Installed Sparge/Vent Well Cluster
- Building
- Concrete
- Asphalt
- Vegetation
- Fence Line
- Utility Pole
- Manhole
- Fire Hydrant
- Adobe or Brick Wall

Utility Lines

- ug — Underground Gas Line
- uw — Underground Water Line
- ufbo — Underground Fiber Optics
- oe — Overhead Electric

N

0 15 30ft

Scale

SITE BASE MAP HIGHLIGHTING PREVIOUSLY INSTALLED REMEDIATION SYSTEM

Phil's Auto Site

701 Isleta Blvd. SW, Albuquerque, New Mexico

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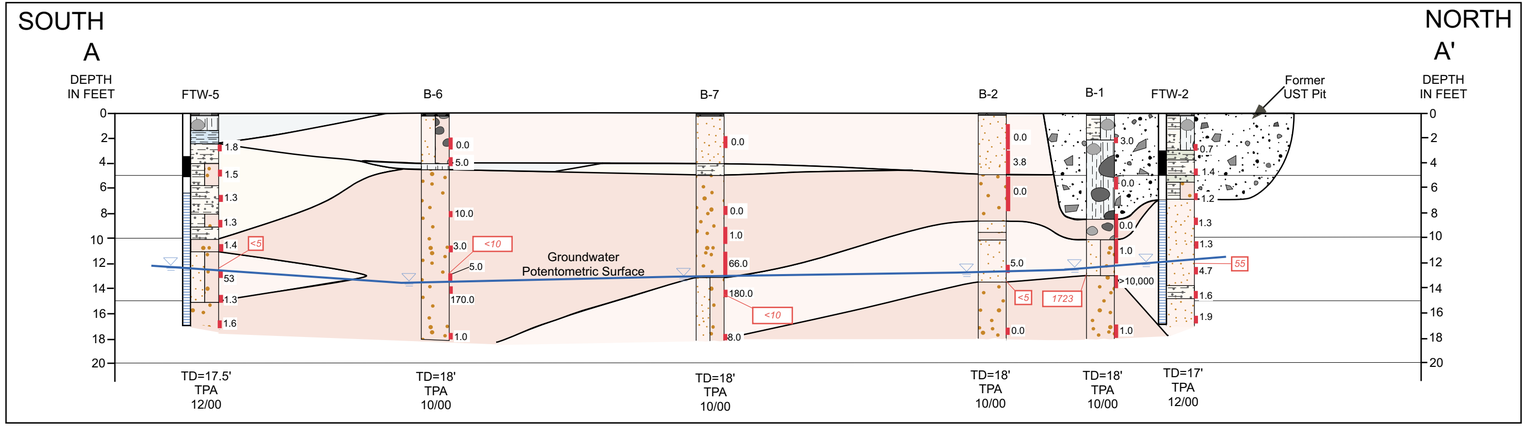
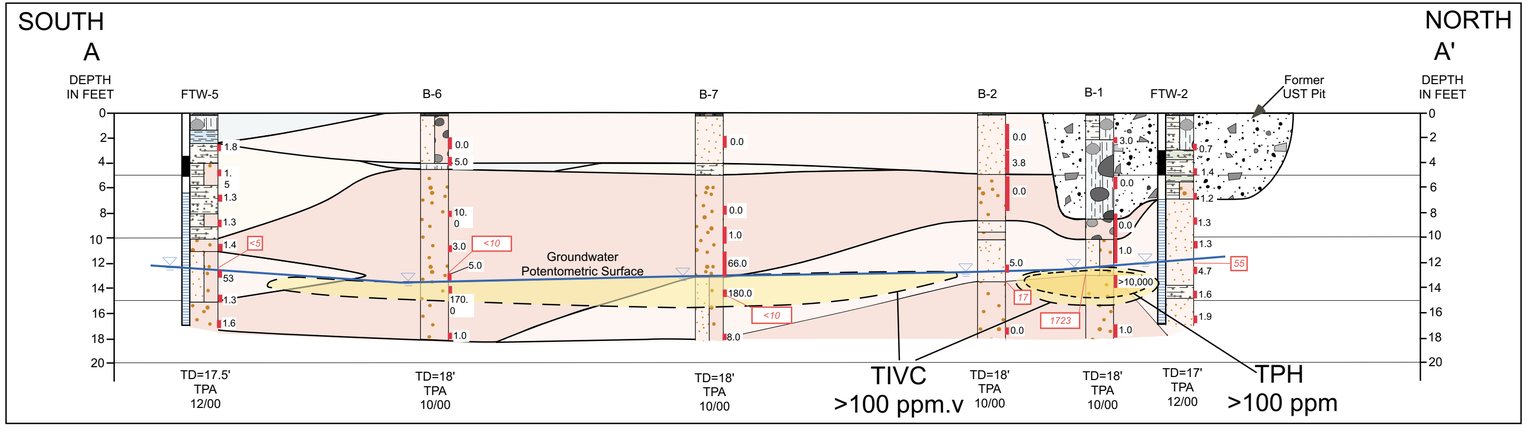
Map Drawn by: WJB	Client: BCEHD
Base Drawn by: *ABL*/KGF/WJB	Project: 99-00-1183
Date : May 2001	Figure: 3



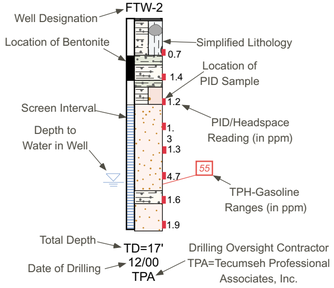


EXPLANATION

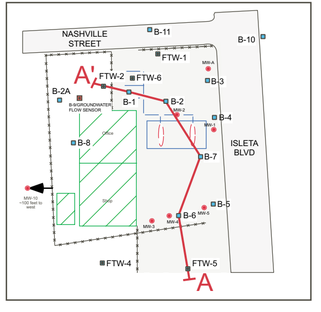
Lithology

- GC Clayey Gravel
- GM Silty Gravel
- GW Sandy Gravel
- SW Gravelly/Poorly Sorted Sand
- SP Well Sorted Sand
- SM Silty Sand
- SC Clayey Sand
- ML Silt
- CL Clay and Silty Clay
- CH Fat Clay
- Asphalt

Well Completion Summary



Location of Cross Section and Site Map



Hydrocarbon Contours

Soils impacted with headspace TIVC >100 ppm/v

Soils impacted with total petroleum hydrocarbons >100 ppm

Scale

8 feet

2.5X Vertical Exaggeration

0

20 feet

Notes

*All boreholes and wells were continuously sampled using a hand auger and drive split spoon samples.

*This Cross Section is an interpretation of available data. Some variations may be expected.

SIMPLIFIED GEOLOGIC AND CONTAMINANT CROSS SECTIONS A-A'

PHIL'S AUTO SITE - ISLETA

701 Isleta Blvd, SW

Albuquerque, New Mexico

FEI | Faith Engineering, Inc.
1000 Lomas Boulevard NW
Albuquerque, New Mexico 87102-1945
(505) 243-5494 • FAX (505) 243-5585
e-mail • faithinc@flash.net

TECUMSEH Professional Associates, Inc.
5600 Wyoming Blvd. NE, Suite 150
Albuquerque, New Mexico 87109
ph: (505) 293-1156 fax: (505) 293-1971

Map Drawn by: WJB	Client: BCEHD
Base Drafted by: *Otter Graphics*	Project: 99-00-1183
Date : May 2001	Figure 4

Large House
ISLETA BLVD.
Yard
House
4930.80
NASHVILLE STREET
4930.90
4930.70
Driveway
4931.00
Former USTs
Former Dispenser Lines
MW-A
4930.77
4931.10
MW-2
4930.74
MW-1
4930.78
Phil's Auto Office
Former Dispensers
MW-10
~100 feet to west
Shop
4930.69
4930.69
4930.68
MW-5
MW-4
MW-3
4930.70
4930.80
4930.90
4931.00
4931.10
4931.11
MW-9
Old Cars
Abandoned Small Building
Old Cars
Dirt Lot
Yard
Grass

EXPLANATION

- Existing Monitor Well Location
- Groundwater Elevation (in feet above msl) — 4931.11
- Inferred Groundwater Flow Direction
- Groundwater Isocontour — 4931.00

- Building
- Concrete
- Asphalt
- Vegetation
- Fence Line
- Utility Pole
- Manhole
- Fire Hydrant
- Adobe or Brick Wall

N

0 15 30ft
Scale

GROUNDWATER POTENTIOMETRIC SURFACE MAP 9-00

Phil's Auto Site
701 Isleta Blvd. SW, Albuquerque, New Mexico

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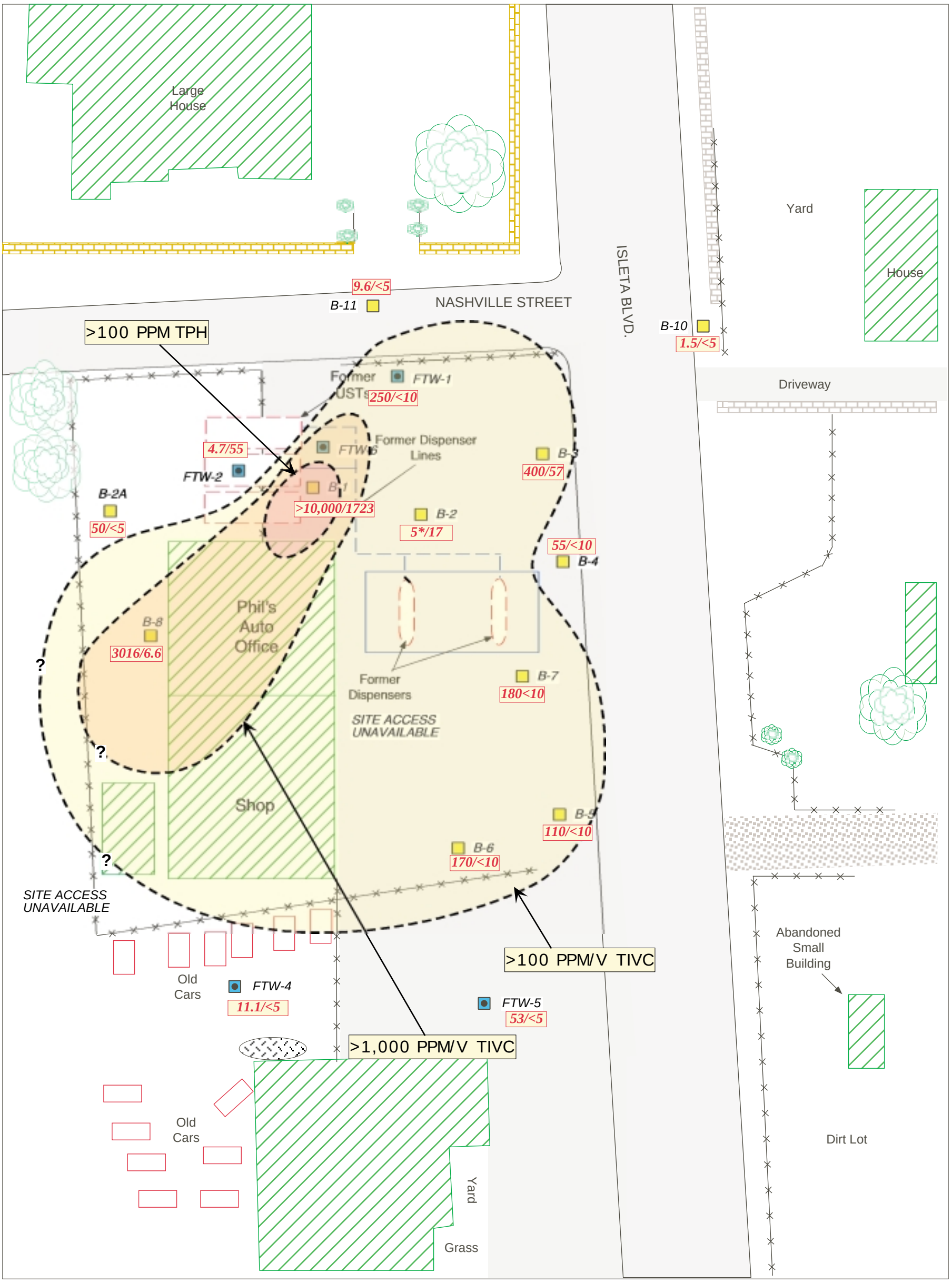
ph: (505) 293-1156 fax: (505) 293-1971

Map Drawn by: WJB	Client: BCEHD
Base Drawn by: *ABL*/KGF/WJB	Project: 99-00-1183
Date : May 2001	Figure 5



EXPLANATION

- New 2" Diameter Monitor Well
- New Soil Boring
- Maximum Soil Headspace Concentration (In parts per million/volume (ppm/v)). note* indicates sample not collected at water table — 1100/230
- Maximum Soil Total Petroleum Hydrocarbons (TPH)Concentration (In parts per million (ppm))
- >100 PPM/V — Soil Headspace Isocontour (In ppm/v))
- >100 PPM — TPH gasoline range Isocontour (in ppm)

- Building
- Concrete
- Asphalt
- Vegetation
- Fence Line
- Utility Pole
- Manhole
- Fire Hydrant
- Adobe or Brick Wall

N

0 15 30ft
Scale

MAXIMUM SOIL HEADSPACE (TIVC) AND TOTAL PETROLEUM HYDROCARBONS (TPH) ISOCONCENTRATION MAP

Phil's Auto Site
701 Isleta Blvd. SW, Albuquerque, New Mexico

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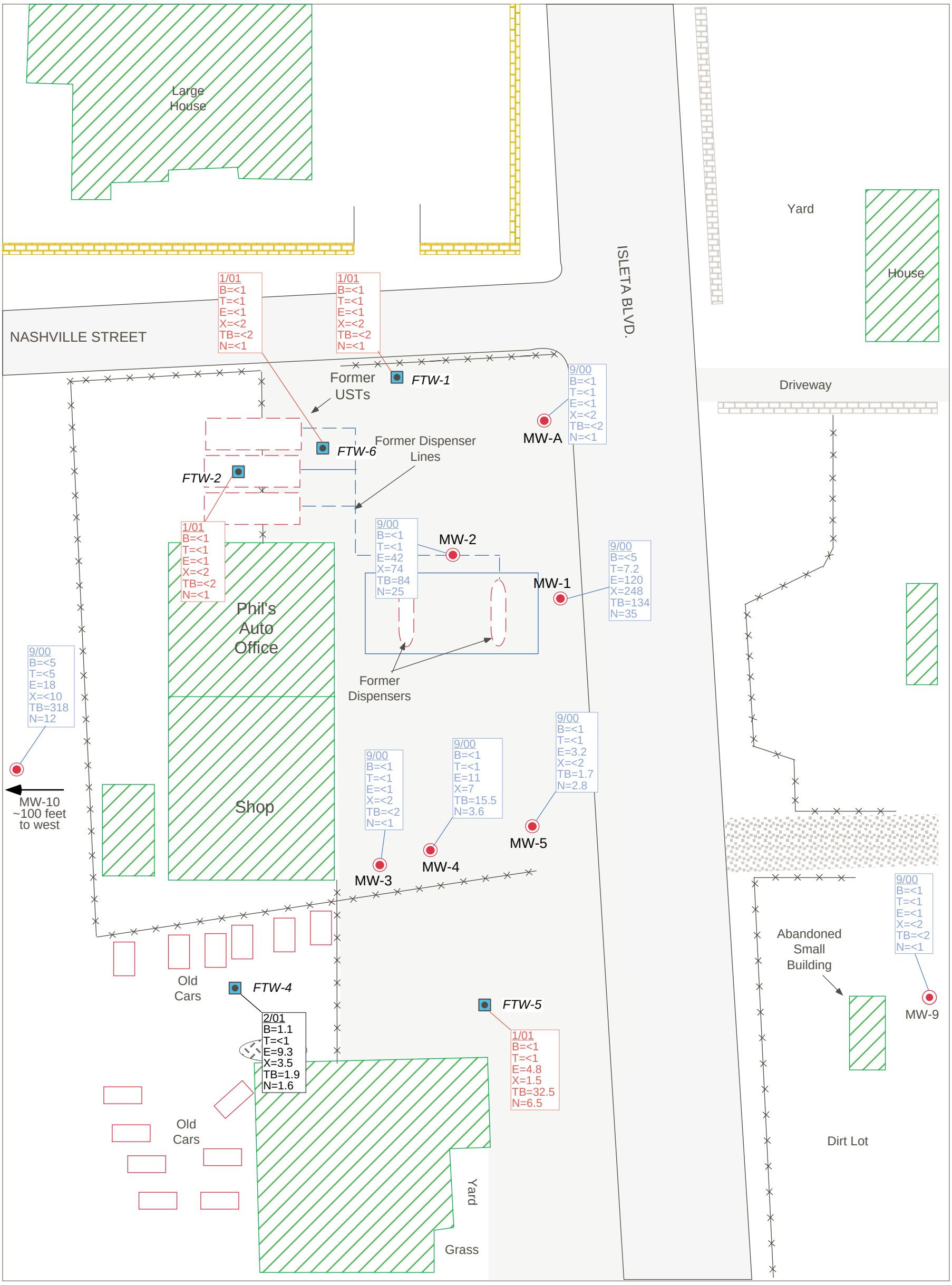
Map Drawn by: WJB/SCG	Client: BCEHD
Base Drawn by: *ABL*/KGF/WJB	Project: 99-00-1183
Date : May 2001	Figure 6



EXPLANATION

- New 2" Diameter Monitor Well
- Existing Monitor Well Location
- >10 ppb — Benzene Groundwater Isocontour (in ppb)

Groundwater Quality Data (in ppb)

9/00	Date of Sampling
B=<1	B=Benzene
T=<1	T=Toluene
E=<1	E=Ethyl Benzene
X=<2	X=Total Xylenes
TB=<2	TB=Trimethyl Benzenes
N=<2	N=Naphthalenes

ND=Non-detect for analyzed compounds

- Building
- Concrete
- Asphalt
- Vegetation
- Fence Line
- Utility Pole
- Manhole
- Fire Hydrant
- Adobe or Brick Wall

N

0 15 30ft
Scale

GROUNDWATER QUALITY MAP 9-00 through 2-01

Phil's Auto Site
701 Isleta Blvd. SW, Albuquerque, New Mexico

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Map Drawn by: WJB/SCG	Client: BCEHD
Base Drawn by: *ABL*/KGF/WJB	Project: 99-00-1183
Date : May 2001	Figure: 7

TABLE 1
00-01-1183-03 •Phil's Auto 701 Isleta Blvd. SW
NMED FACILITY #1537
SUMMARY OF GROUND WATER ELEVATION MEASUREMENTS

WELL NUMBER	ELEVATION (feet above datum)	DATE	STATIC (feet BG)	WATER LEVEL (feet AD)	(+) = RISING (-) = FALLING
MW-A	4942.00	9/14/00	11.73	4930.27	
		1/30/01	11.23	4930.77	0.50
MW-1	4942.12	9/14/00	11.84	4930.28	
		1/30/01	11.34	4930.78	0.50
MW-2	4942.56	9/14/00	12.33	4930.23	
		1/30/01	11.82	4930.74	0.51
MW-3	4942.79	9/14/00	12.64	4930.15	
		1/30/01	12.11	4930.68	0.53
MW-4	4942.53	9/14/00	12.37	4930.16	
		1/30/01	11.84	4930.69	0.53
MW-5	4941.86	9/13/00	11.69	4930.17	
		1/30/01	11.17	4930.69	0.52
MW-9	4941.48	9/14/00	10.86	4930.62	
		1/30/01	10.37	4931.11	0.49
MW-10	4941.36	9/14/00	11.18	4930.18	
		1/30/01	10.62	4930.74	0.56
FTW-1	†	1/30/01	11.17	*	**
FTW-2	†	1/30/01	11.78	*	**
FTW-4	†	2/16/01	10.86	*	**
FTW-5	†	1/30/01	10.85	*	**
FTW-6	†	1/30/01	11.29	*	**

† - pending elevation survey

* - not determined, pending elevation

** - will be determined with another measurement

Data checked _____ / _____

TABLE 2
Phil's Auto 701 Isleta
00-01-1183-03 • NMED FACILITY # 1537
SOIL BORING ANALYSIS RESULTS

		ORGANICS										HYDROCARBONS				
LOCATION	**DATE SAMPLED**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**	**EDB**	**EDC**	**TMB**	**NAPHTHALENE**	**TPH C6-C14 8015 GRO**	**C6-C10 8015 DRO**	**C10-C22 8015 DRO**	**C22-C36 8015 DRO**	**Total TPH 8015 DRO**
UNITS		**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**
STANDARDS						**50**						**100**				**100**
B-1-13.0' (SP/SW)	10/13/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	4.1	< 0.05	*	760	950	13	**1723**
B-1-12'-12.5' (SW)	10/16/00	<0.05	0.25	5.8	19.2	25.25	<0.05	<0.05	<0.05	10.3	2.4	*	110	230	<10	**340**
B-2A-12.5-13 (SM)	12/5/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	Δ
B-2-13.0'-14.0' (SP)	10/13/00	< 0.05	< 0.05	0.3	2.8	3.1	< 0.05	< 0.05	< 0.05	5.2	0.59	*	17	< 10	< 10	17
B-3-12.5'-13.0' (SP)	10/16/00	< 0.05	< 0.05	< 0.05	< 0.15	< 0.3	< 0.05	< 0.05	< 0.05	2.43	0.15	*	25	32	< 10	57
B-4-13.0'-13.5' (SP)	10/16/00	< 0.05	< 0.05	0.24	0.84	1.08	< 0.05	< 0.05	< 0.05	1.17	0.24	*	< 10	< 10	< 10	Δ
B-5-13.0'-13.5' (SW)	10/16/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	*	< 10	< 10	< 10	Δ
B-6-12.5'-13.0' (SW)	10/16/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	*	< 10	< 10	< 10	Δ
B-7-14.0'-14.5' (SP/SW)	10/16/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	*	< 10	< 10	< 10	Δ
B-8, 12.5-13 (SM)	12/5/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	6.6	*	*	*	Δ
B-9, 10.5-11.5 (SW)	2/2/01	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	Δ
B-10, 11.5-12 (SP)	2/2/01	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	Δ
FTW-1-13.5'-14.0' (SW)	10/16/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	*	< 10	< 10	< 10	Δ
FTW-2, 12.0-12.5 (SP)	12/6/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	55	*	*	*	Δ
FTW-4, 12' (SP/SW)	2/2/01	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	Δ
FTW-5, 12.0-13 (SP/SW)	12/6/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	Δ

BOLD - Above NMED Standards

Δ - Sum not calculated for non-detects

* - Not analyzed using that method

Data checked _____ / _____

Faith Engineering, Inc
5/23/01

TABLE 3
Phil's Auto 701 Isleta
00-01-1183-03 • NMED FACILITY #1537
CURRENT GROUND WATER ANALYSIS RESULTS

		ORGANICS									INORGANICS									INDICATORS		
LOCATION	**DATE SAMPLED**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**	**EDB**	**EDC**	**TMB**	**NAPHTHALENE**	**IRON**		**PHOSPHATE**	**SULFIDE**	**SULFATE (Lab)**	**ALKALINITY as CaCO.**	**DISS O2**		**NITRATE**	**pH**	**CONDUCTIVITY**	**TEMP**
UNITS		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	ug/l	µg/l	µg/l	mg/l		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l		µmhos/cm	˚C
STANDARDS		**10**	**750**	**750**	**620**	**100**	**0.1**	**10**		**30**	SOLUBLE	TOTAL					METER	FIELD				
MW - A	9/18/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.4	0.4	1.0	0.0	*	250	*	0.5	0.8	6.63	936	26.3
MW - 1	9/18/00	< 5.0	7.2	120	248	< 5.0	< 5.0	< 5.0	134	**35**	0.6	0.8	1.0	1.0	*	325	*	0.5	0.2	6.94	943	23.4
MW - 2	9/18/00	< 1.0	< 1.0	42	74	< 1.0	< 1.0	< 1.0	84	25	0.3	0.4	0.8	1.0	*	250	*	1.0	0.6	6.99	1002	23.2
MW - 3	9/18/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.1	0.6	0.4	0.0	*	225	*	2.0	0.2	6.87	841	21.6
MW - 4	9/18/00	< 1.0	< 1.0	11	< 8.0	< 1.0	< 1.0	< 1.0	15.5	3.6	2.0	2.0	1.0	0.1	*	250	*	1.0	0.2	6.88	961	24.6
MW - 5	9/18/00	< 1.0	< 1.0	3.2	< 2.0	< 1.0	< 1.0	< 1.0	< 2.7	2.8	1.0	1.5	1.5	0.0	*	250	*	0.5	0.4	6.88	958	24.3
MW - 9	9/18/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.0	0.1	5.0	0.0	*	250	*	2.0	1.5	6.67	1160	20.8
MW - 10	9/18/00	< 5.0	< 5.0	18	< 10	< 5.0	< 5.0	< 5.0	318	12	0.8	1.0	2.0	0.2	*	350	*	1.0	0.4	7.10	1375	22.0
Rinsate	9/18/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	*	*	*	*	*	*	*	*	*	*	*	*
FTW-1	1/30/01	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 0.01	< 1.0	< 2.0	< 1.0	1.0	2.0	0.2	0.1	*	300	0.54	2.0	0.6	7.32	1047	16.2
FTW-2	1/30/01	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 0.01	< 1.0	< 2.0	< 1.0	1.0	5.0	1.5	0.8	*	300	1.59	2.0	1.5	7.44	857	15.1
FTW-4	2/16/01	1.1	< 1.0	9.3	3.5	< 1.0	< 1.0	< 1.0	< 2.9	1.6	1.6	*	< 0.05	*	88.0	390	0.49	*	< 0.10	7.47	794	16.5
FTW-5	1/30/01	< 1.0	< 1.0	4.8	< 2.5	< 1.0	< 0.01	< 1.0	32.5	6.5	3.0	4.0	0.2	5.0	*	350	0.82	0.5	0.6	7.33	899	17.4
FTW-6	1/30/01	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 0.01	< 1.0	< 2.0	< 1.0	0.2	0.6	1.0	0.2	*	175	1.26	1.0	1.5	7.31	91.6	14.8

* - Not Sampled

Data checked _____ / _____

Faith Engineering, Inc
5/23/01

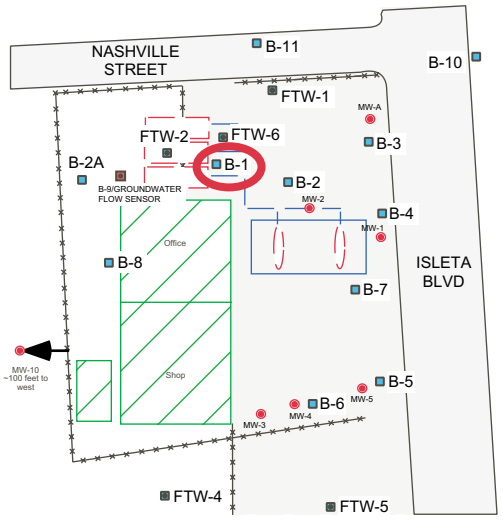
APPENDIX A

Borehole Lithologic Logs

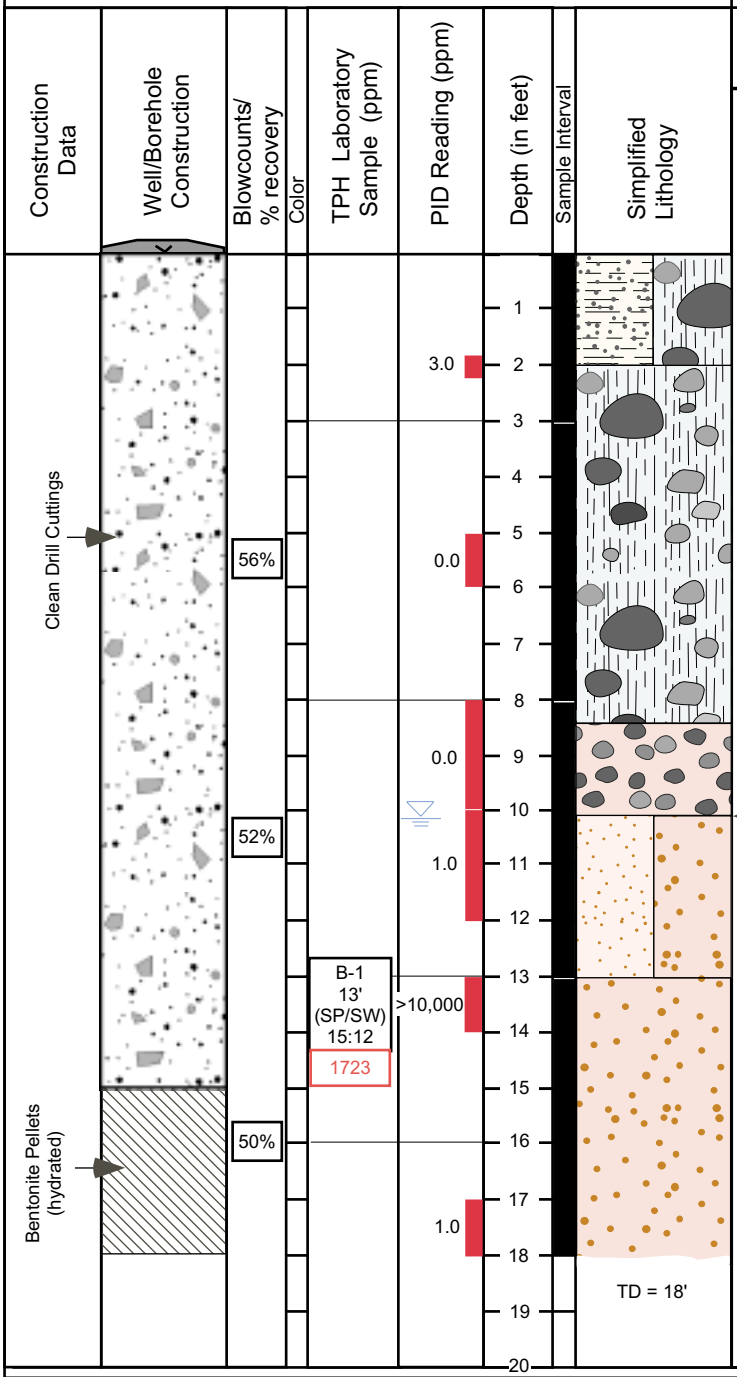
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-1**

DATE OF DRILLING: 10-13-00
LOGGED BY: W.Brown/R.Sengebush
DRILLER: Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 3" Dia. 5' Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: 10.1'
TOTAL DEPTH: 18'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



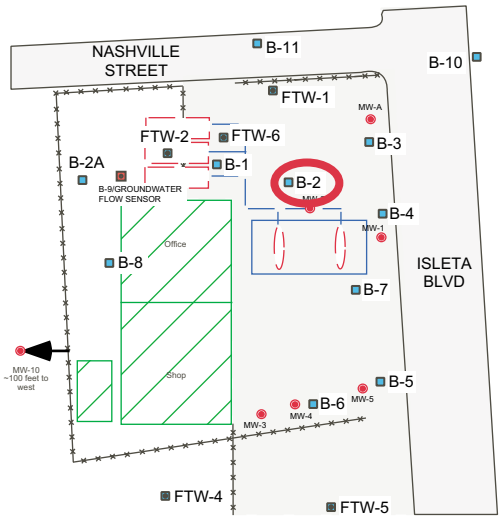
Surface Conditions: Loose Soil.
0.0'-3.0' Hand Auger Fill material (**SM/GM**) Silty sand matrix surrounding concrete/gravel clasts, no apparent hydrocarbon odor, moist.
3.0'-8.0' Split Spoon 2.8' sample. 0.0'-2.8' Fill (**GM**) as above, brown (**10YR**) slightly moist, no apparent hydrocarbon odor.
8.0'-13.0' Split Spoon 2.6' sample. 0.0'-0.4' Fill (**GM**) as above. 0.4'-2.1' (**GP**) Fine-sand, light tan(**10YR**) unconsolidated, slightly moist with ~20-30% rounded 1"-3" gravel clasts, trace odor at base. 2.1'-2.6' (**SP/SW**) Medium to coarse sand with trace pebbles, water saturated, light brown (**10YR**) at top with sharp color and odor change to (**N5**) gray, strong hydrocarbon odor at base.
13.0'-18.0' 2.5' sample. (**SW**) Medium to coarse sand with 2% pebbles to 2" diameter, water saturated, brown (**10YR**), very poorly sorted.

TECUMSEH PROFESSIONAL ASSOCIATES, INC.
ONE SYCAMORE PLAZA, 5600 WYOMING BLVD, NE, ALBUQUERQUE, NEW MEXICO 87113
PHONE: (505) 293-1156 FAX: (505) 293-1971

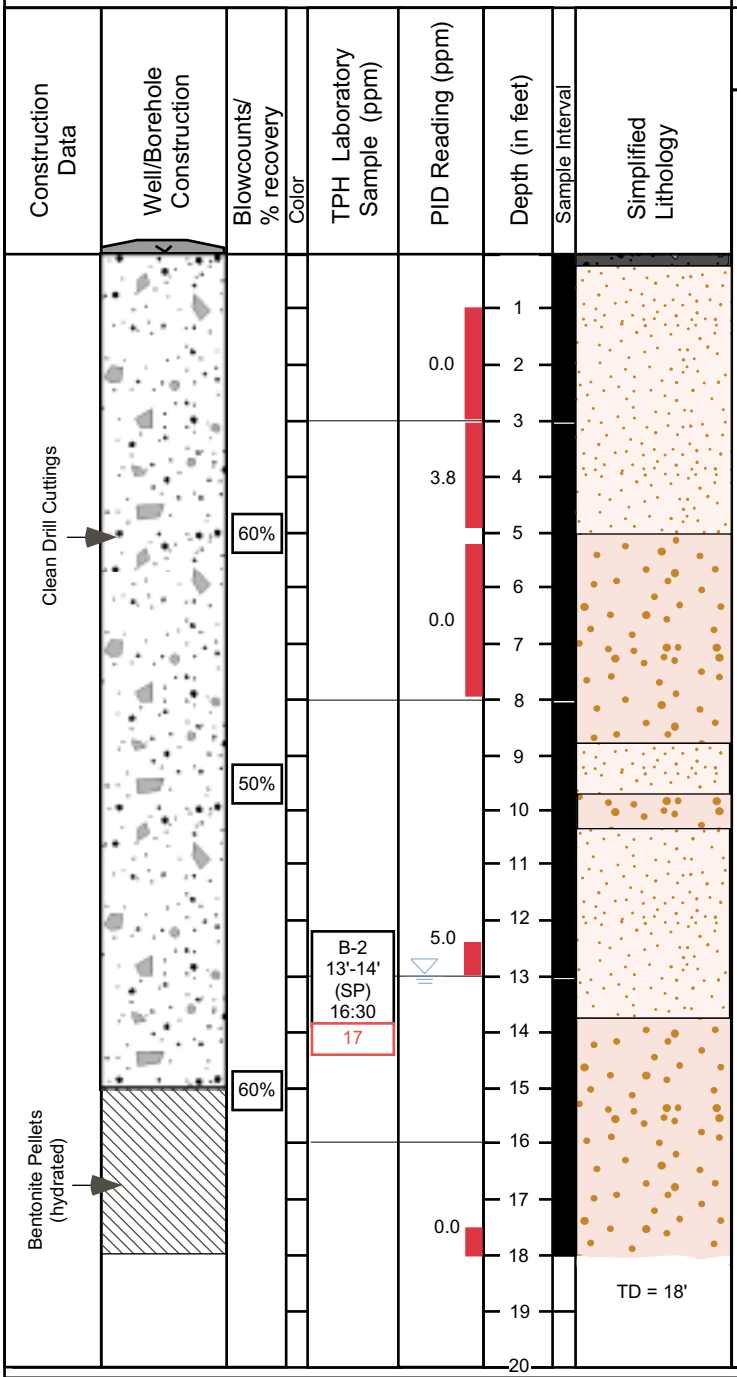
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-2**

DATE OF DRILLING: 10-13-00
LOGGED BY: T. Chavez
DRILLER: Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 3" Dia. 5' Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: 13'
TOTAL DEPTH: 18'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-3.0' Hand Auger (**SP**) (**10YR**) Brown fine sand, well sorted, no hydrocarbon odor, moist.
3.0'-8.0' Split Spoon 3.0' sample. 0.0'-2.0' Fill (**SP**) fine sand, (**10YR**) brown, moist, well sorted grading to; 2.0'-3.0' (**SW**) gravelly sand, poorly sorted, cobbles ~20-30%, no hydrocarbon odor, moist.
8.0'-13.0' Split Spoon 2.5' sample. 0.0'-1.8' (**SW**) Gravelly sand, poorly sorted, moist (**10YR**)brown. 1.8'-2.1' (**SW**) Gravelly sand, poorly sorted, cobbles present (**10YR**) light brown, moist. 2.1'-2.5' (**SP**) Fine sand, well sorted, unconsolidated (**10YR**) light brown, no hydrocarbon odor.
13.0'-18.0' 3.0' sample. 0.0'-0.8' (**SP**) Fine sand, well sorted (**10YR**) brown, hydrocarbon odor, water saturated. 0.8'-2.5' (**SW**) Gravelly poorly sorted, hydrocarbon odor (**10YR**) brown. 2.5'-3.0' (**SP**) Fine sand, well sorted, weak hydrocarbon odor (**10YR**) light brown.

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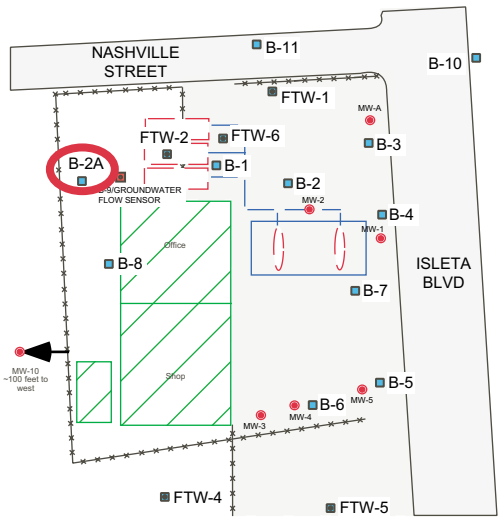
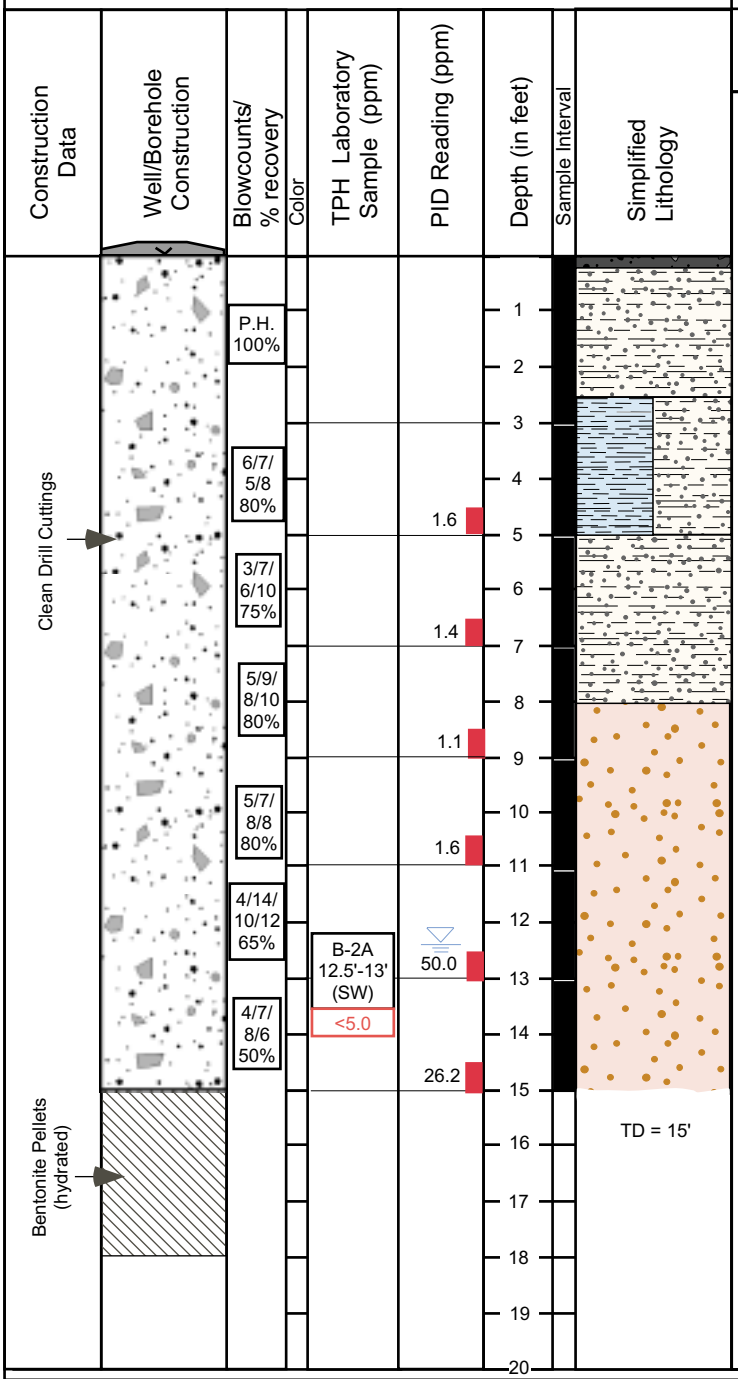
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-2A**

DATE OF DRILLING:	12-05-00
LOGGED BY:	S. Grietens
DRILLER:	Harvey/Rodgers
BOREHOLE DIAMETER:	8"
DRILLING METHOD:	Hollow Stem Auger
SAMPLING METHOD:	2" Dia. Continuous Split Spoon
TOP OF CASING ELEV:	NA
DEPTH TO WATER:	~12.5'
TOTAL DEPTH:	15'
CASING:	NA
SCREEN:	NA
SURFACE COMPLETION:	NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.

0.0'-3.0' Hand Auger (**SM**) (**5YR 4/6**) Fine silty sand, occasional clay nodule (1/2"-1"), moist, no odor, soft, clay is medium plasticity, soft, <1% pebbles 1/8".

3.0'-5.0' Split Spoon (**5YR 4/6**) 1.75' sample. 0.0'-0.3' (**CL**) Sandy clay, fine sand, medium plasticity, moist, no odor. 0.3'-1.4' (**SM**) Fine silty sand, soft, moist, no odor.

5.0'-7.0' Split Spoon (**SM**) (**5YR 4/6**) 1.6' sample. Fine silty sand, soft, moist, no odor.

7.0'-9.0' Split Spoon (**SW**) (**5YR 4/6**) 1.7' sample. Fine to coarse sand, some fines, <1% pea/pebble gravel (1/8"-1/4"), moist, soft, no odor.

9.0'-11.0' Split Spoon (**SW**) (**5YR 4/6**) 1.7' sample. Fine to coarse sand, some fines, <2% pea/thumb gravel (1/4"-3/4"), moist, soft, no odor.

11.0'-13.0' Split Spoon (**SW**) (**5YR 4/6**) 1.6' sample. Fine to coarse sand, some fines, <2% pea/thumb gravel (1/4"-3/4"), moist to wet, soft, no odor.

13.0'-18.0' Split Spoon (**SW**) (**5YR 4/6 - N5**) 1.0' sample. Fine to coarse sand, some fines, <2% pea/thumb gravel (1/4"-3/4"), soft, wet, no odor.

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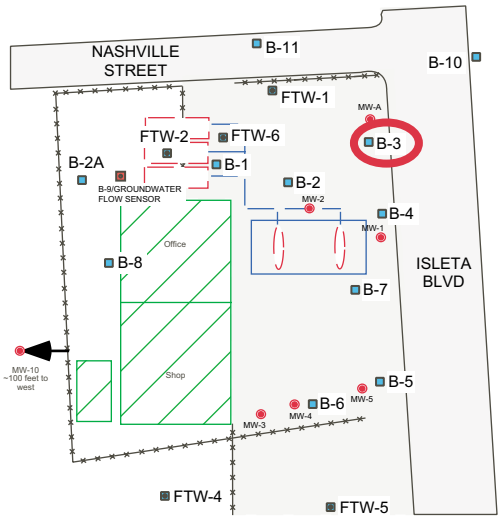
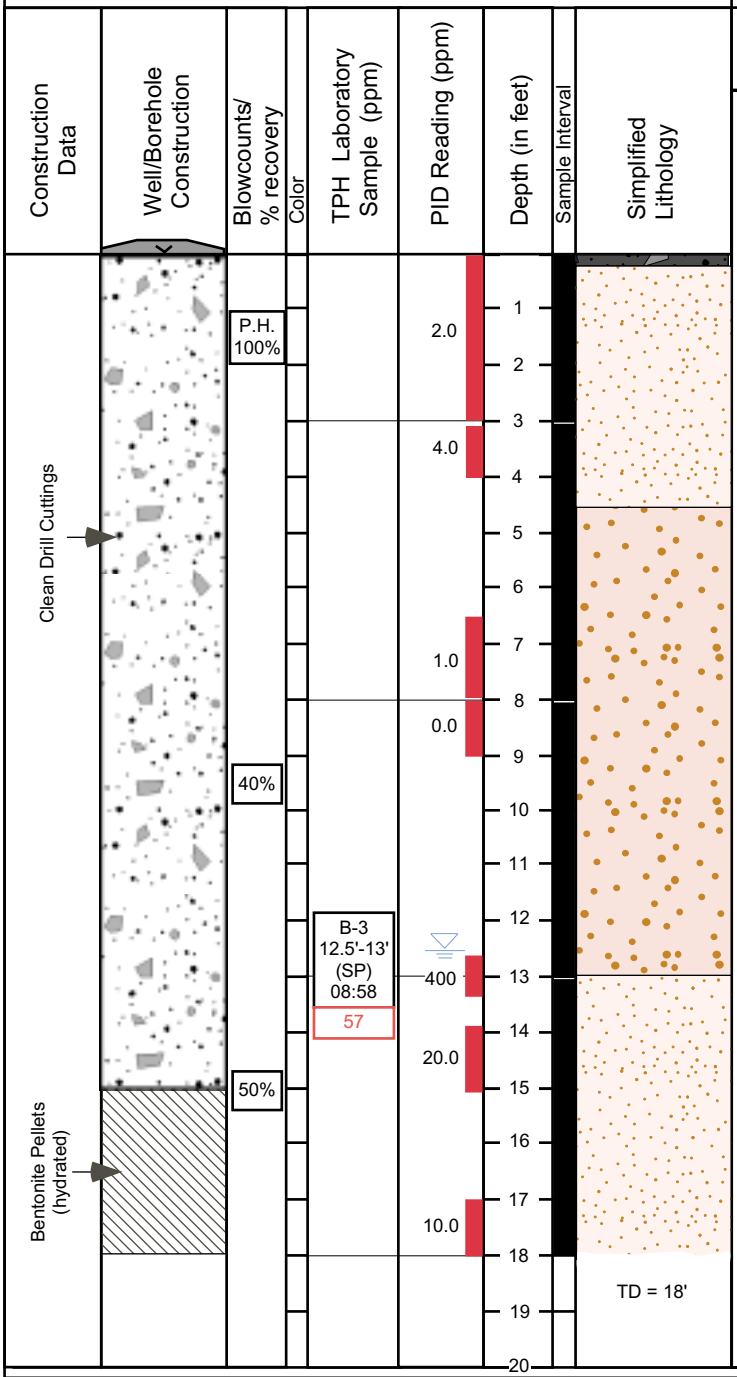
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-3**

DATE OF DRILLING: 10-16-00
LOGGED BY: T. Chavez/R.Sengebush
DRILLER: Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2" Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: ~12.5'
TOTAL DEPTH: 15'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-3.0' Hand Auger (**SP**) (**10YR**) Medium to fine sand, well sorted, moist, no odor.
3.0'-8.0' Split Spoon 2.5' sample. 3.0'-4.5' (**SP**) Medium to fine sand. 4.5'-6.5' (**SW**) Medium to coarse sand, pebbles 5% to .5", moist, no odor.
8.0'-13.0' Split Spoon 2.0' sample. 8.0'-9.0' (**SW**) (**10YR**) Gravelly sand mixture, pebbles 15% to 1" diameter. 9.0'-10.0' (**SW**) (**10YR**) Medium to coarse sand, moist, no odor.
13.0'-18.0' 2.5' sample. 13.0'-15.5' (**SP**) (**10YR**) medium sand, very well sorted, saturated, strong petroleum odor, strong sheen.

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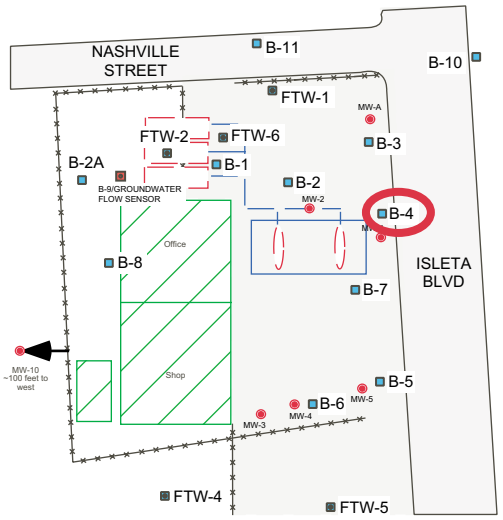
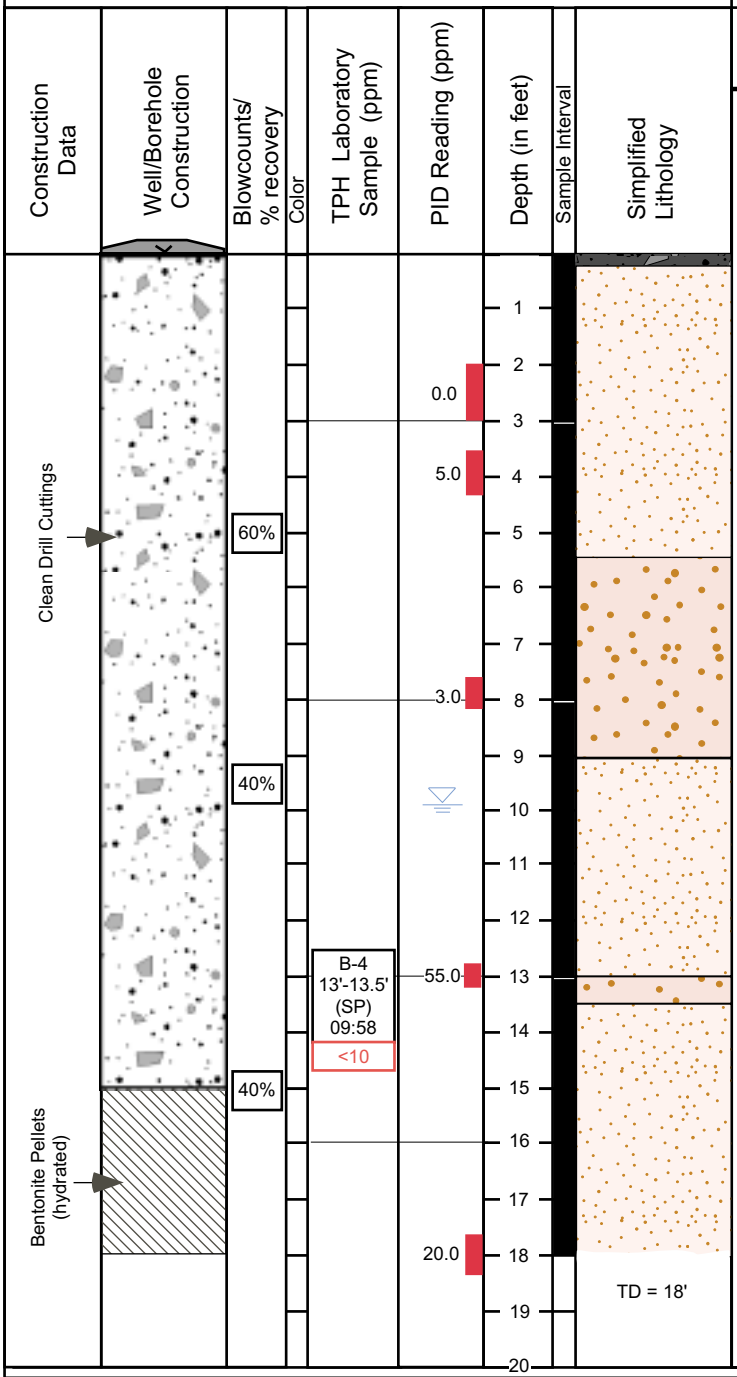
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-4**

DATE OF DRILLING: 10-16-00
LOGGED BY: R. Sengebush
DRILLER: Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 3" Dia. 5' Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: 10'
TOTAL DEPTH: 18'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Soil.
0.0'-3.0' Hand Auger (**SP**) (**10YR**) Medium to fine sand, well sorted, moist, no odor.
3.0'-8.0' Split Spoon 3.0' sample. 3.0'-5.5' (**SP**) (**10YR**) Medium to coarse sand, moist, no odor. 5.5'-6.0' (**SW**) (**10YR**) Gravelly sand, medium to coarse, moist, no odor, 15%-20% gravel rounded to 1.5".
8.0'-13.0' Split Spoon 2.0' sample. 8.0'-9.0' (**SW**) (**10YR**) Gravelly sand , medium to coarse, poorly sorted with gravel to 15%, gravel is rounded and fine to coarse to 1.5" diameter. 9.0'-10.0' (**SP**) (**10YR**) Medium to coarse sand, well sorted, shoe at 13' is (**5Y 4/1**) olive gray, strong petroleum odor, water saturated.
13.0'-18.0' 2.0' sample. 13.0'-13.5' (**SW**) (**10YR**) Brown gravelly sand, water saturated, no odor. 13.5'-15' (**SP**) (**10YR**) Sand, well sorted, medium grained, trace coarse, water saturated, no odor.

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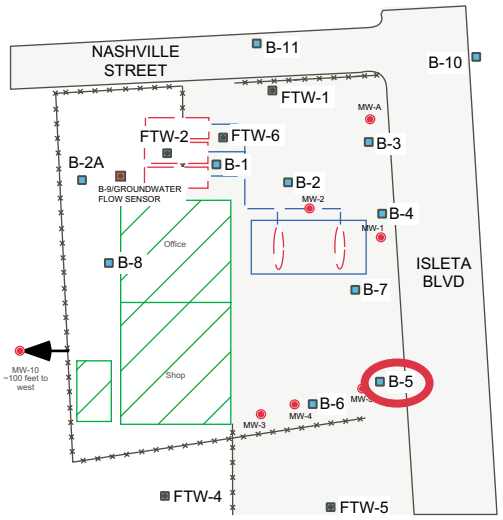
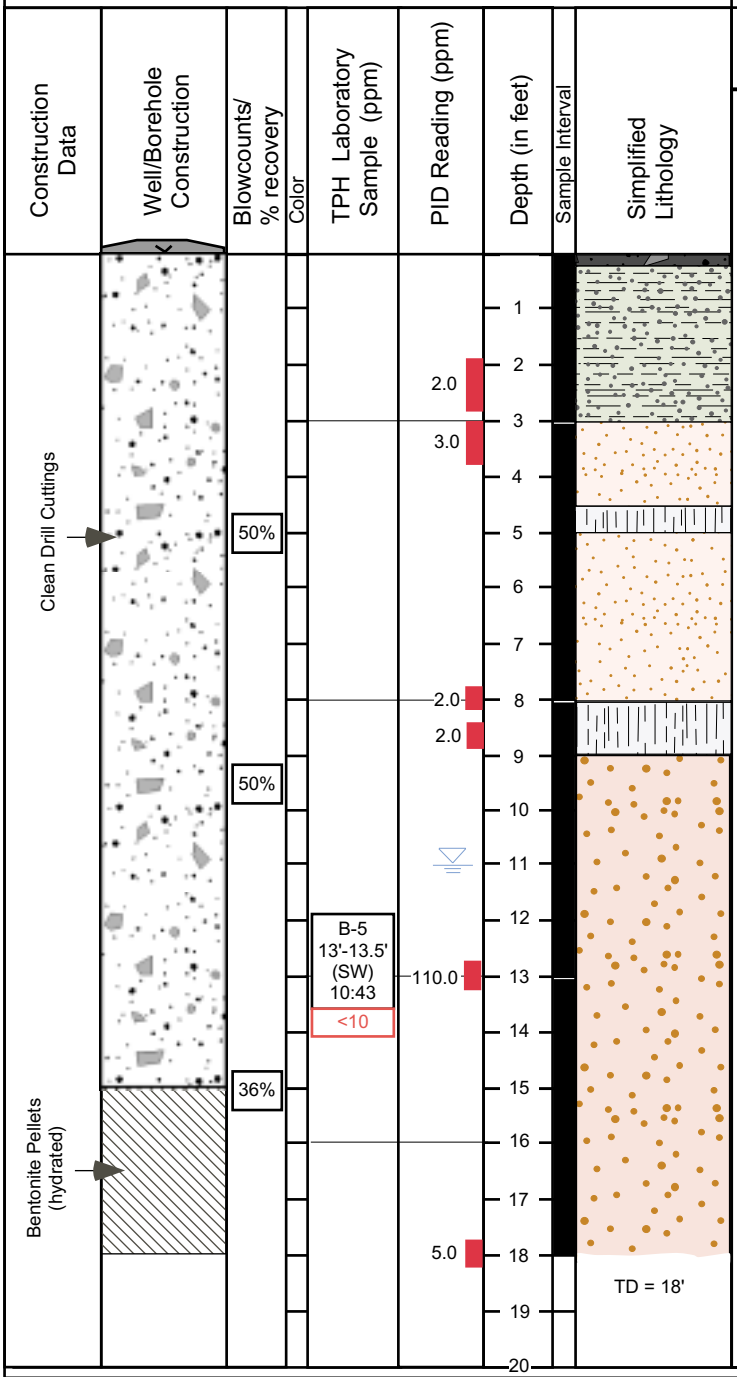
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-5**

DATE OF DRILLING: 10-16-00
LOGGED BY: R. Sengebush
DRILLER: Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 3" Dia. 5' Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: 11'
TOTAL DEPTH: 18'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-3.0' Hand Auger (**SP**) (**5YR**) Yellowish red clayey sand, moist, no odor.
3.0'-8.0' Split Spoon 2.5' sample. 3.0'-4.0' (**SP**) (**10YR**) Orange brown with FeOX stain, medium grained sand, well sorted, moist, no odor. 4.0'-4.5' (**SP**) (**10YR**) Light brown sand, medium grained, very well sorted, moist, no odor. 5.0'-5.5' (**SP**) (**10YR**) Light brown sand, medium to coarse, well sorted, moist, no odor.
8.0'-13.0' Split Spoon 2.5' sample. 8.0'-9.0' (**ML**) (**10YR**) Light brown sand, very fine grained, very well sorted, moist, no odor. 9.0'-10.5' (**SW**) (**10YR**) Light brown gravelly sand, medium to coarse, moderately sorted, gravel is fine to coarse, gravel is rounded to 1.5" 10-15%.
13.0'-18.0' Split Spoon 1.8' sample. 13.0'-14.8' (**SW**) (**10YR**) Brownish yellow-gray sand, medium to coarse, poorly sorted, 5% fine gravel to 1/4", water saturated, no odor.

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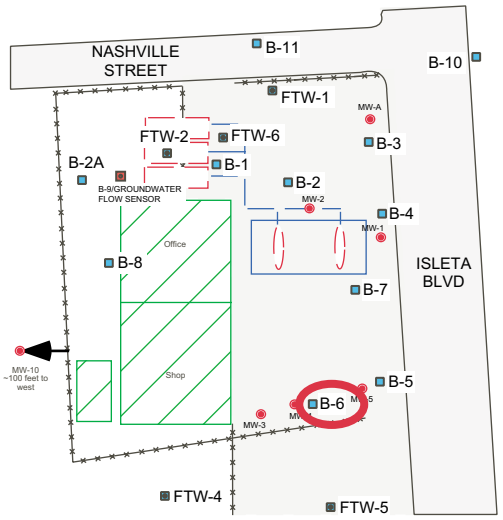
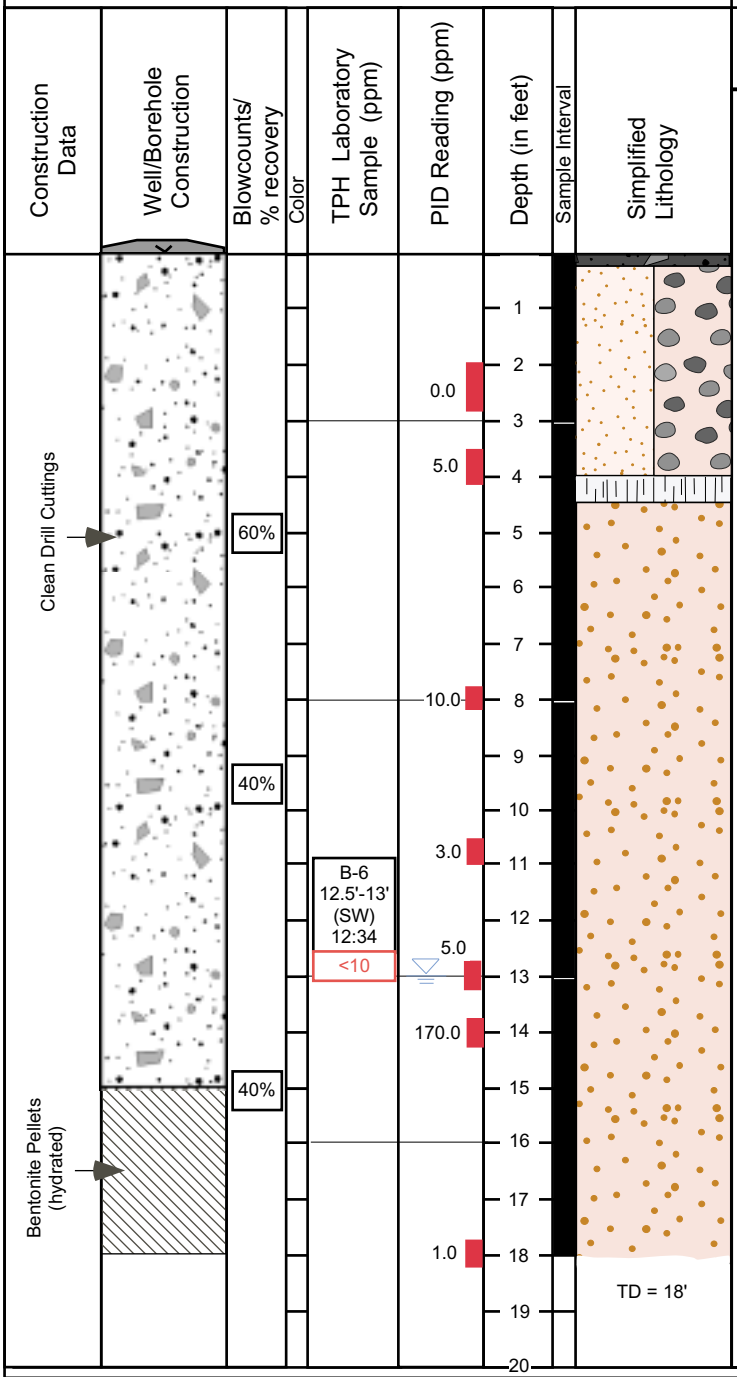
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-6**

DATE OF DRILLING: 10-16-00
LOGGED BY: R. Sengebush
DRILLER: Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 3" Dia. 5' Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: 13'
TOTAL DEPTH: 18'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-3.0' Hand Auger (**GP**) (**10YR**) Sand with cobbles to 4", rounded, 10-20%, moist, no odor.
3.0'-8.0' Split Spoon 3.0' sample. 3.0'-4.0' (**SP**) (**10YR**) Brownish yellow sand, medium grained, well sorted, moist, no odor. 4.0'-4.5' (**ML**) (**10YR**) Brownish yellow sand, fine to very fine grained, very well sorted, moist, no odor. 4.5'-7.0' (**ML**) (**10YR**) Light brown sand, medium to coarse with gravel 10%, pebbles to 1" in diameter, rounded, dry, loose, no odor.
8.0'-13.0' Split Spoon 2.0' sample. 8.0'-10.0' (**SW**) (**10YR**) Light brown sand, medium to coarse grained, poorly sorted, 5-10% gravel, rounded to 1" in diameter, no odor, gravel clasts are granite (60%). quartz (30%), quartzite (10%) and siltstone (5%).
13.0'-18.0' Split Spoon 2.0' sample. 13.0'-15.0' (**SW**) (**N5**) Gray at ~13'-14', gravelly sand, sand is medium to coarse, poorly sorted, gravel is 10-15%, rounded clasts to 1" diameter, water saturated, moderate petroleum odor at 13'. 14.0'-15.0' As above but (**10YR**) brownish yellow, no odor.

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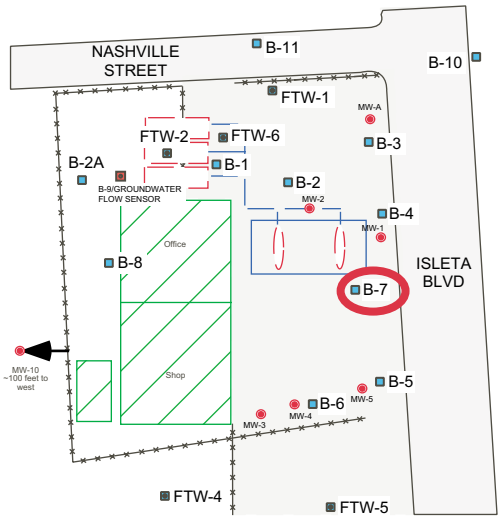
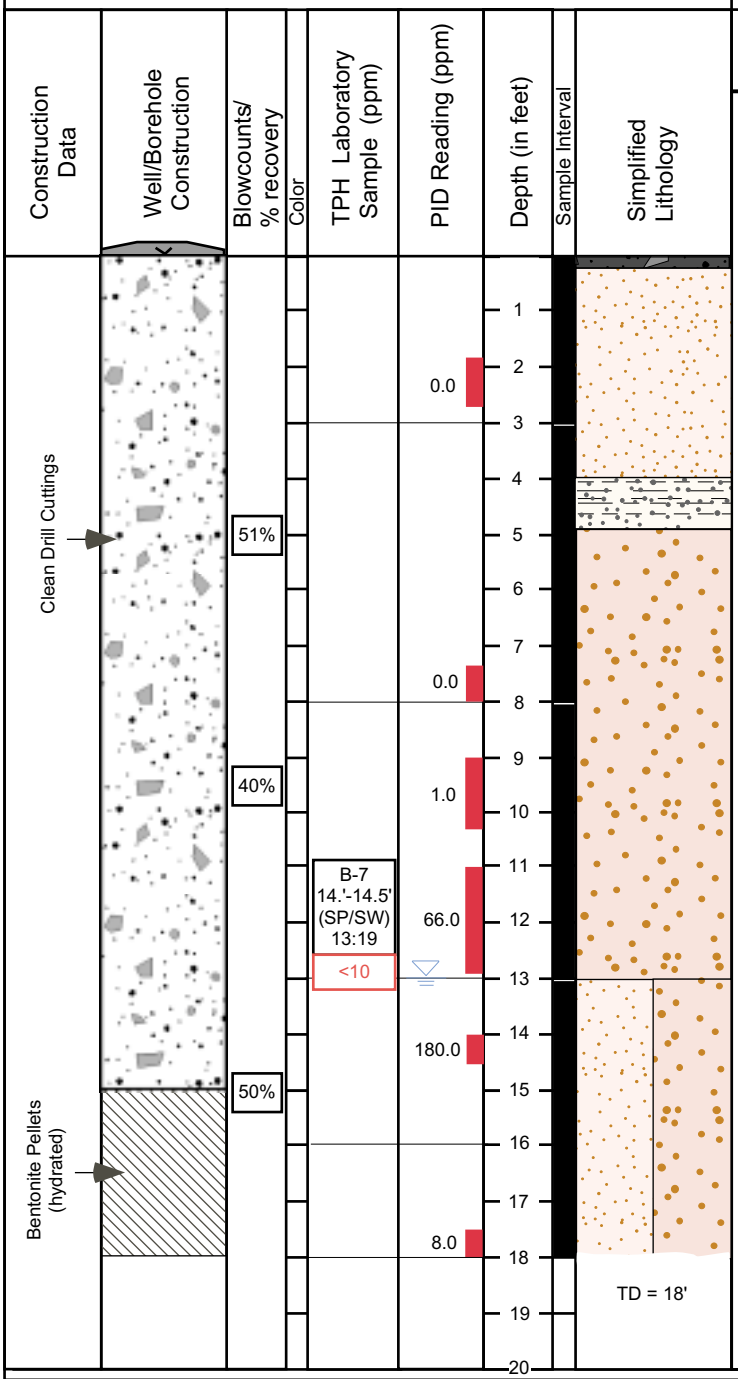
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-7**

DATE OF DRILLING: 10-16-00
LOGGED BY: R. Sengebush
DRILLER: H. Reichert/Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 3" Dia. 5' Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: 13.5'
TOTAL DEPTH: 18'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-3.0' Hand Auger (**SP**) (**10YR**) Brown well sorted fine sand, no hydrocarbon odor, moist, uconsolidated.
3.0'-8.0' Split Spoon 2.6' sample. 0.0'-1.0' (**SP**) (**10YR**) Brown medium to fine grained sand, moist, no hydroarbon odor. 1.0'-1.8' (**SM**) (**10YR**) Brown silty fine sand, moist, no hydrocarbon odor. 1.8'-2.6' (**SW**) Medium to coarse grained sand with cobbles (2-3") (**10YR**) light brown, moist, no hydrocarbon odor.
8.0'-13.0' Split Spoon 2.0' sample. 0.0'-2.0' (**SW**) Gravelly sand with cobbles at base (3-4" diameter)(**N7**) light gray, no hydrocarbon odor, moist.
13.0'-18.0' Split Spoon 2.5' sample. 0.0'-2.5' (**SP/SW**) Medium to fine grained sand, water saturated, (**N5**) gray, no gravels/pebbles present.

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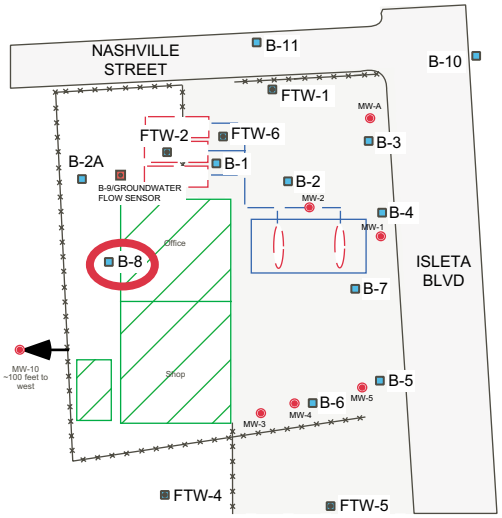
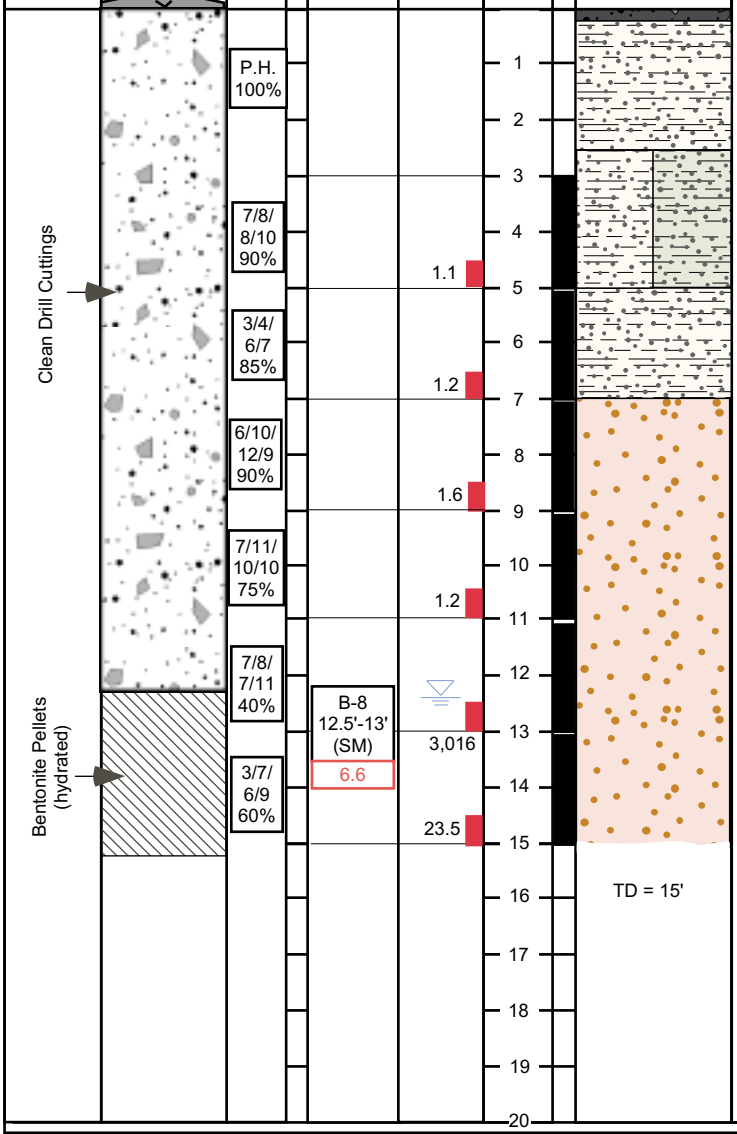
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-8**

DATE OF DRILLING: 12-05-00
LOGGED BY: S.Grietens
DRILLER: Harvey/Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2" Dia. Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: ~12.5'
TOTAL DEPTH: 15'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-3.0' Hand Auger (**SM**) (**5YR 4/6**) Fine silty sand, soft, slightly moist, trace fine gravel, no odor.
3.0'-5.0' Split Spoon (**5YR 4/6**) 1.8' sample. 0.0'-0.4' (**SC**) Clayey sand, slightly moist, non-plastic. 0.4'-1.8' (**SM**) (**5YR 4/6**) Fine grained silty sand, soft, moist, no odor.
5.0'-7.0' Split Spoon (**SM**) (**5YR 4/6**) 1.75' sample. 0.0'-1.75' Fine silty sand, soft, moist, no odor, trace pea gravel.
7.0'-9.0' Split Spoon (**SW**) (**5YR 4/6**) 1.8' sample. 0.0'-1.8' Fine to coarse sands with little fines, <2% fine gravel (1/4") loose, slightly moist, soft, no odor.
9.0'-11.0' Split Spoon (**SW**) (**5YR 4/6**) 1.5' sample. 0.0'-1.5' Fine to coarse sand with little fines, <2% fine gravel (1/4"), loose, slightly moist, no odor.
11.0'-13.0' Split Spoon (**SW**) (**N3**) 0.4' sample. 0.0'-0.3' (**5YR 4/6**) Fine to coarse sand, little fines, <1% fine gravel (1/4" diameter) loose, slight hydrocarbon odor. 0.3'-0.4' (**N3**) Fine to coarse sand, little fines, <1% pea gravel (1/4" diameter), loose, hydrocarbon odor, wet.
13.0'-18.0' Split Spoon (**SW**) (**N3**) 1.2' sample. Fine to coarse sand, little fines, <1% fine gravel (1/4" diameter), loose, wet, no odor.

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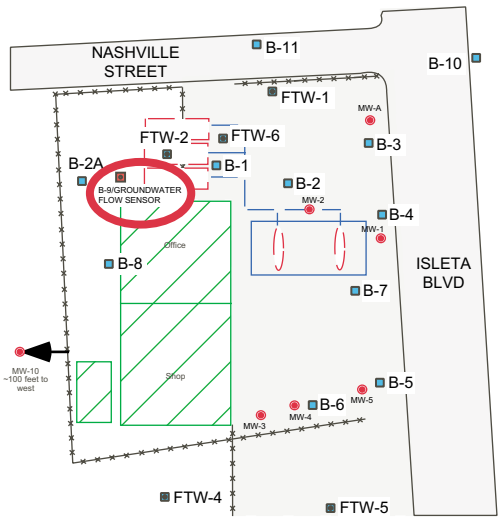
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-9**

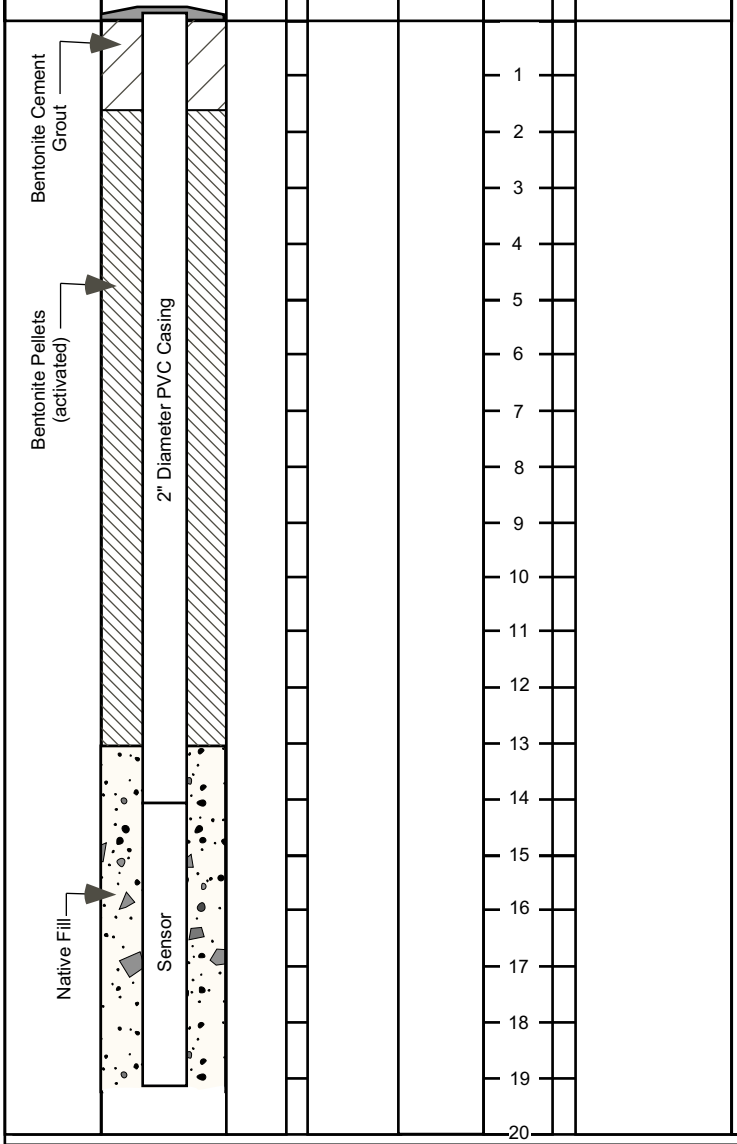
DATE OF DRILLING: 12-07-00
LOGGED BY: S.Grietens
DRILLER: H. Reichert/Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2" Continuous Split Spoon/Posthole
TOP OF CASING ELEV: NA
DEPTH TO WATER: ~12'
TOTAL DEPTH: 19'
CASING: 2" Dia. 14' PVC
SCREEN: Sensor 5' 2" PVC
SURFACE COMPLETION: 12" Vault

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION

See adjacent log from borehole B-2a



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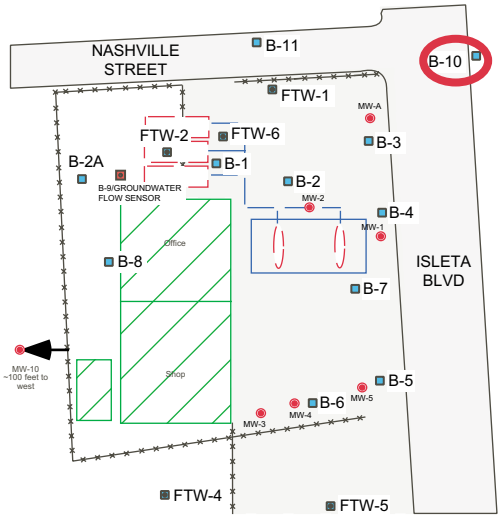
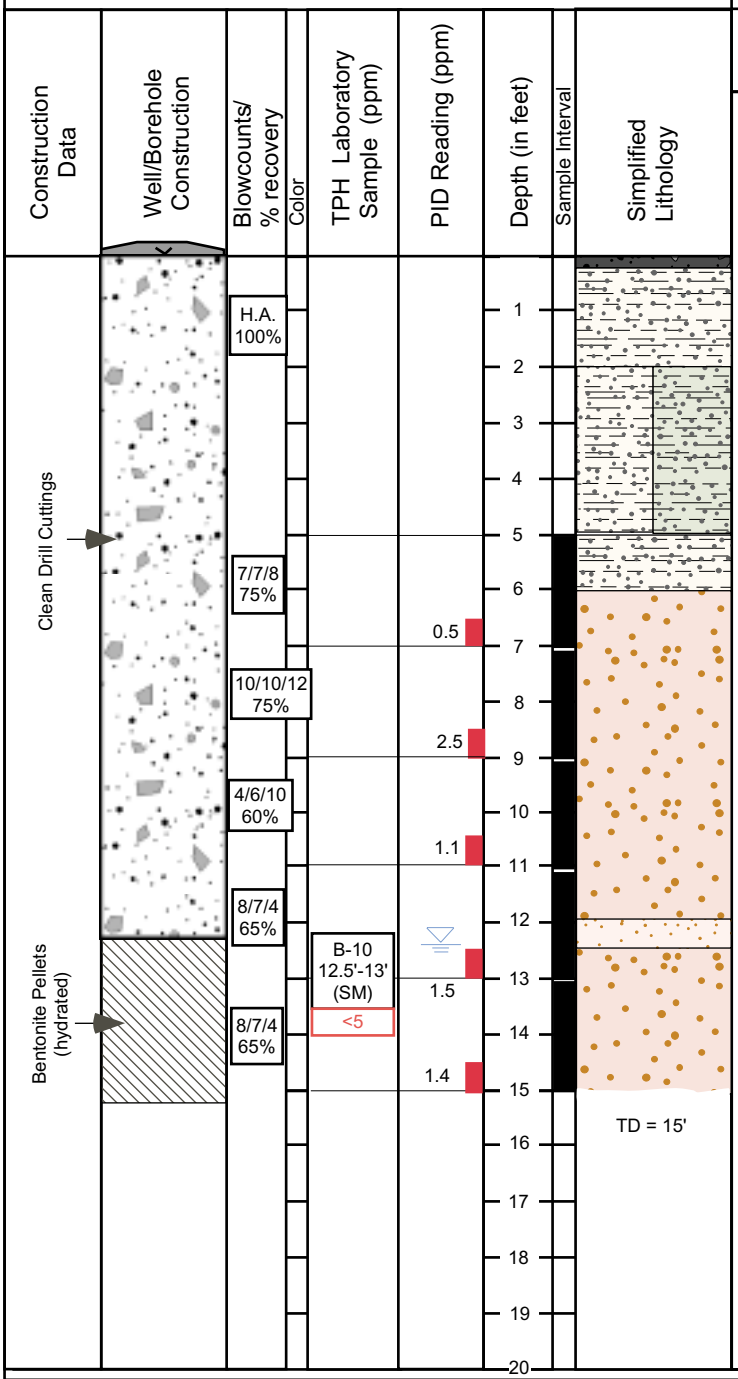
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-10**

DATE OF DRILLING: 02-02-01
LOGGED BY: S.Grietens
DRILLER: Stan/Nevex
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2" Dia. Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: ~12'
TOTAL DEPTH: 15'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-5.0' Split Spoon (**5YR 4/6**) 0.0'-2.0' (**SM**) Silty sand, fine to medium, slightly moist, no odor, soft/firm. 2.0'-5.0' (**SM/SC**) Silty/clayey fine sand, some medium grained, soft-firm, slightly moist, no odor.
5.0'-7.0' Split Spoon (**10YR 5/3**) 0.0'-1.0' (**SM**) Very fine silty sand, soft, no odor. 1.0'-1.5' (**SW**) Fine to coarse sand with fines, trace fine gravel, slightly moist, no odor.
7.0'-9.0' Split Spoon (**SW**) (**10YR 5/3**) 1Fine to coarse sands with fines, fine to medium gravel, no odor, slightly moist.
9.0'-11.0' Split Spoon (**SW**) (**10YR 5/3**) Same as (7.0'-9.0') above.
11.0'-13.0' Split Spoon (**10YR 6/8**) **65%** 0.0'-0.3' (**SW**) Same as (7.0'-9.0') above. 0.3'-1.1' (**SP**) Fine grained sand, trace fines, well sorted, wet, no odor.
13.0'-15.0' Split Spoon (**SW**) (**10YR 6/8**) **95%** Same as (7.0'-9.0') above.

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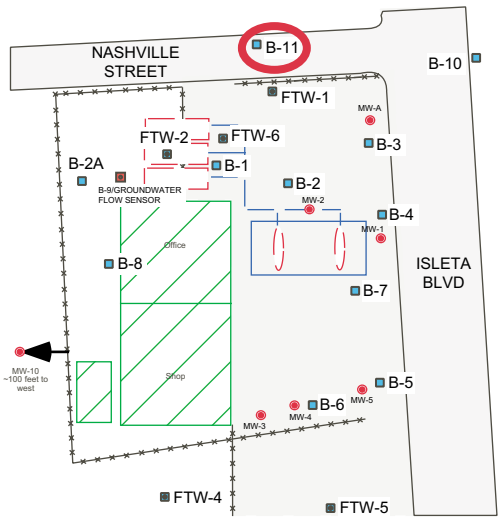
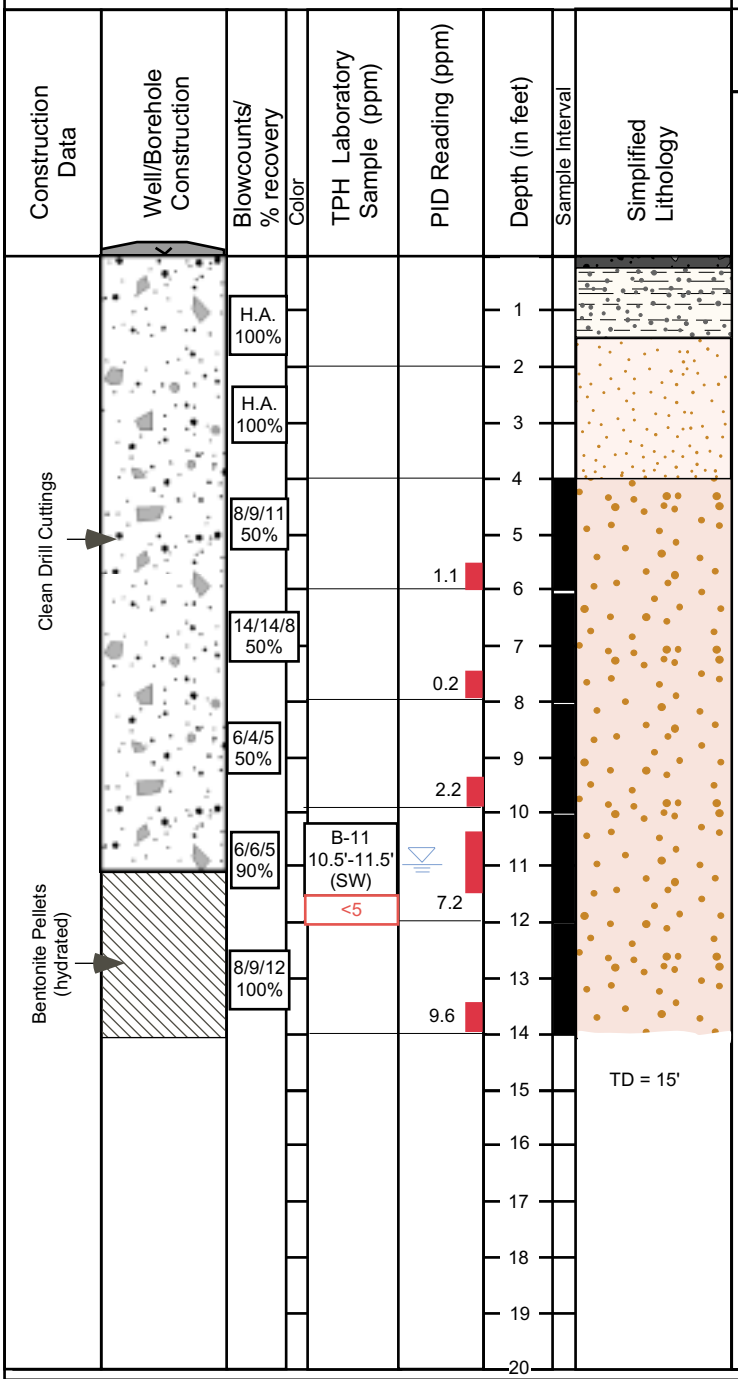
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **B-11**

DATE OF DRILLING: 02-02-01
LOGGED BY: S.Grietens
DRILLER: Stan/Nevex
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2" Dia. Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: ~11'
TOTAL DEPTH: 14'
CASING: NA
SCREEN: NA
SURFACE COMPLETION: NA

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt
0.0'-0.2' Asphalt
0.2'-2.0' Hand Auger (**5YR 4/6**) **100%** 0.2'-1.5' (**SM**) Fine silty sand, soft, slightly moist, no odor. 1.5'-2.0' (**SP**) Well sorted fine sand, some fines, soft, no odor, slight moisture, trace coarse sand.
2.0'-4.0' Split Spoon (**SP**) (**5YR 4/6**) **100%** Well sorted fine sand, soft, slightly moist, no odor, trace coarse sand.
4.0'-6.0' Split Spoon (**SW**) (**5YR 4/6**) **50%** Fine to coarse sand with fines, fine to coarse gravel with fines, slightly moist, no odor.
6.0'-8.0' Split Spoon (**SW**) (**5YR 4/6**) **50%** Same as (4.0'-6.0') above.
8.0'-10.0' Split Spoon (**5YR 4/6**) **50%** 0.0'-0.5' (**SW**) Fine to coarse sands with fines, fine to coarse gravel, soft, slightly moist, no odor. 0.5'-1.0' (**SP**) Well sorted fine sand, trace medium sand, soft, slightly moist, no odor, fairly sharp contact between (**SW/SP**).
10.0'-12.0' Split Spoon (**SW**) (**5YR 4/6**) **90%** Fine to coarse sands with fines, sinr to medium gravel, moist/wet, no odor.
12.0'-14.0' Split Spoon (**SW**) (**5YR 4/6**) **100%** Fine to coarse sands with fines, trace fine gravel, wet, no odor.

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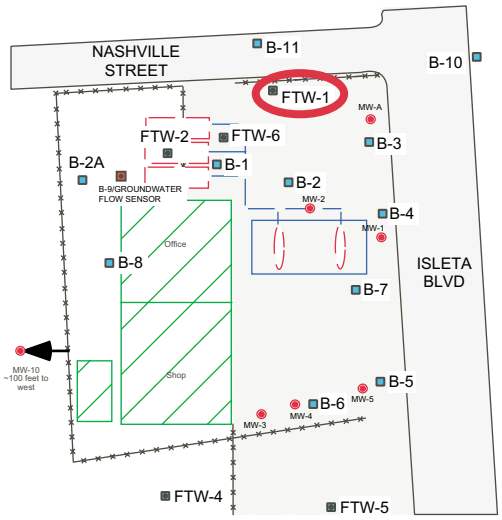
ONE SYCAMORE PLAZA, 5600 WYOMING BLVD, NE, ALBUQUERQUE, NEW MEXICO 87113
PHONE: (505) 293-1156 FAX: (505) 293-1971

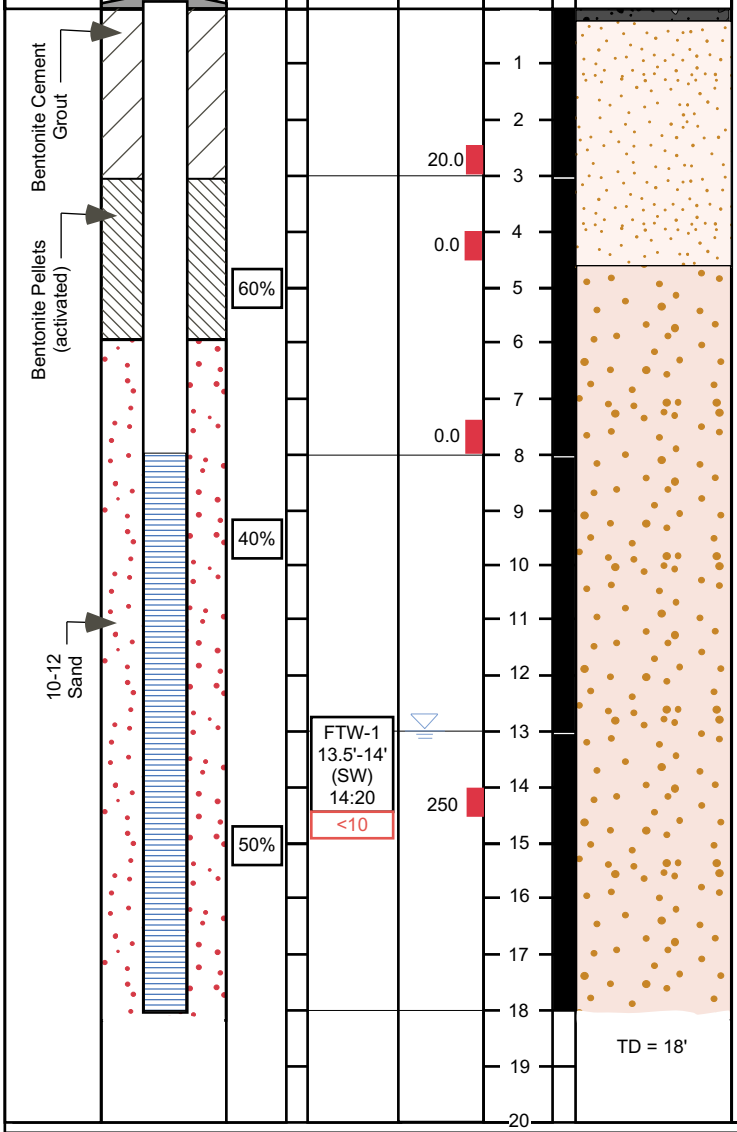
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **FTW-1**

DATE OF DRILLING: 10-16-00
LOGGED BY: T. Chavez
DRILLER: Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2" Dia.Continuous Split Spoon
TOP OF CASING ELEV: NA
DEPTH TO WATER: 13'
TOTAL DEPTH: 18'
CASING: 0'-8' 2" Dia. Sched 40 PVC Blank
SCREEN: 10' 0.01" Slot Sched 40 2" Dia. 80 PVC
SURFACE COMPLETION: 8"X12" Can with Concrete Pad

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-3.0' Hand Auger (**SP**) Fine grained sand with pea sized gravel throughout core, moist, (**10YR**) brown, no hydrocarbon odor.
3.0'-8.0' Split Spoon 3.0' sample. 0.0'-1.8' (**SP**) (**10YR**) Brown fine grained sand, unconsolidated, moist, no hydrocarbon odor, gradually grading to; 1.8'-3.0' (**SW**) gravelly sand with 0.5"-1.0" cobbles (**10YR**) tan brown, moist, no hydrocarbon odor, subrounded sides on gravel.
8.0'-13.0' Split Spoon 2.0' sample. 0.0'-2.0' (**SW**) Gravelly sand, (**10YR**) light brown, moist, no hydrocarbon odor, at 1.0' interval cobbles (1"-2" diameter) present throughout layer, subrounded to rounded gravel.
13.0'-18.0' 2.5' sample. 0.0'-2.5' (**SW**) Gravelly sand, poorly sorted (1"-2" cobbles present), water saturated throughout core sample, (**10YR**) dark brown, strong hydrocarbon odor.

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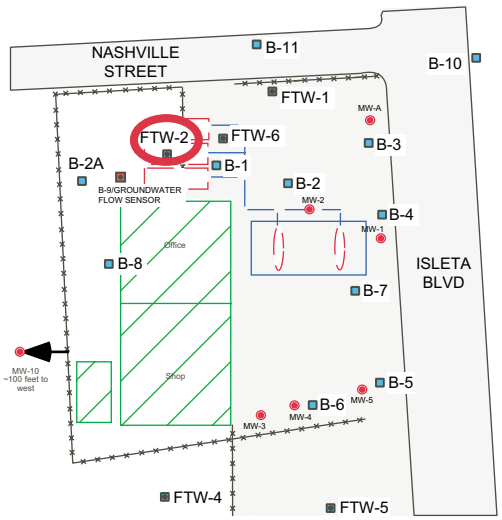
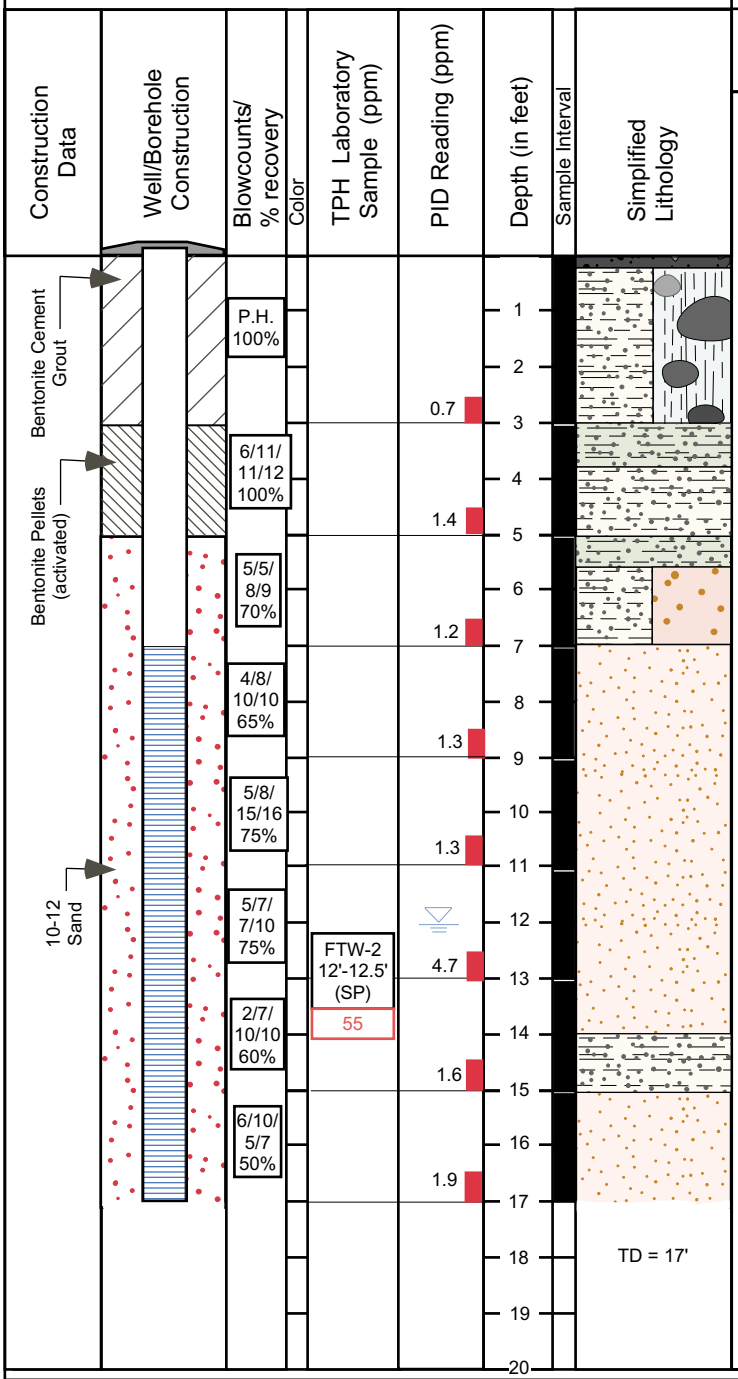
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **FTW-2**

DATE OF DRILLING:	12-06-00
LOGGED BY:	S.Grietens
DRILLER:	H.Reichert/Rodgers
BOREHOLE DIAMETER:	8"
DRILLING METHOD:	Hollow Stem Auger
SAMPLING METHOD:	2" Dia. Continuous Split Spoon
TOP OF CASING ELEV:	NA
DEPTH TO WATER:	~12'
TOTAL DEPTH:	17'
CASING:	0-7' 2" Dia. Sched 40 PVC
SCREEN:	2" Dia. 10' .01 Slot PVC
SURFACE COMPLETION:	8"X12" Manway with Concrete Pad

BOREHOLE LOCATION





USCS - LITHOLOGIC DESCRIPTION

Drilled in former UST pit.

Surface Conditions: Dirt
0.0'-3.0' Posthole (**SM/GM**) (**5YR 4/6**) **100%** Silty sands, fine to coarse grained with gravel ranging in size from 1/4"-3" with occasional cobbles up to 5"-6" (stones, blades) ~10% gravel/cobbles, moist, soft, no odor.
3.0'-5.0' Split Spoon (**Fill**) (**5YR 4/6**) 2.0' sample. 0.0'-0.8' (**SC**) Clayey sand, fine grain with silt, medium plasticity, moist, soft, no odor. 0.8'-1.8' (**SM**) Silty sand, fine grained, soft, moist, no odor. 1.8'-2.0' (**SM**) Silty sand, fine to medium grain with trace fine gravel, moist, soft, no odor.
5.0'-7.0' Split Spoon (**Fill**) (**5YR 4/6**) 1.6' sample. 0.0'-0.3' (**SC**) Clayey sand, fine grained with silt, medium plasticity, moist, soft, no odor. 0.3'-0.7' (**SM**) Silty sand, fine grained, with trace coarse sand and fine (1/4") gravel, soft, moist, no odor. 0.7'-1.6' (**SM/SW**) Silty sand, fine to coarse grained trace (1/4") fine gravel, soft, moist, no odor.
7.0'-9.0' Split Spoon (**SP**) (**5YR 4/6**) 1.3' sample. 0.0'-1.3' Poorly graded sand, little fines, moist, no odor, trace fine to medium gravel 1/4"-1.5".
9.0'-11.0' Split Spoon (**SP**) (**5YR 4/6**) 1.5' sample. Same as (7.0'-9.0') above.
11.0'-13.0' Split Spoon (**SP**) (**5YR 4/6**) 1.5' sample. 0.0'-1.5' Same as (7.0'-9.0') above, slight odor-very slight-may be natural, wet.
13.0'-15.0' Split Spoon (**5YR 4/6 - N5**) 1.3' sample. 0.0'-0.4' (**SP**) Same as (7.0'-9.0') above. 0.4'-1.3' (**SM**) Silty sand, fine to medium grain, trace coarse sand (<1%), soft, wet, no odor.
15.0'-17.0' Split Spoon (**SP**) (**5YR 4/6**) 1.0' sample. 0.0'-1.0' Same as (7.0'-9.0') above.

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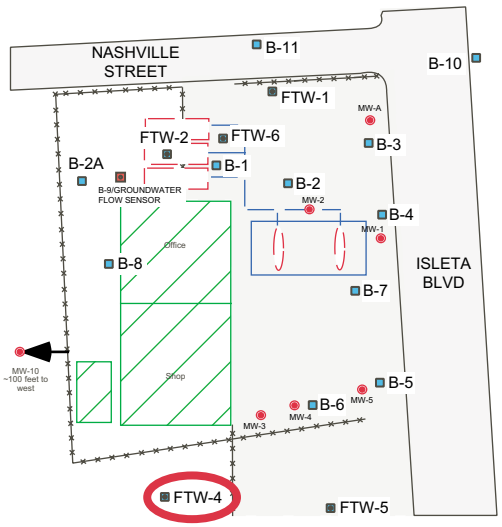
ONE SYCAMORE PLAZA, 5600 WYOMING BLVD, NE, ALBUQUERQUE, NEW MEXICO 87113
PHONE: (505) 293-1156 FAX: (505) 293-1971

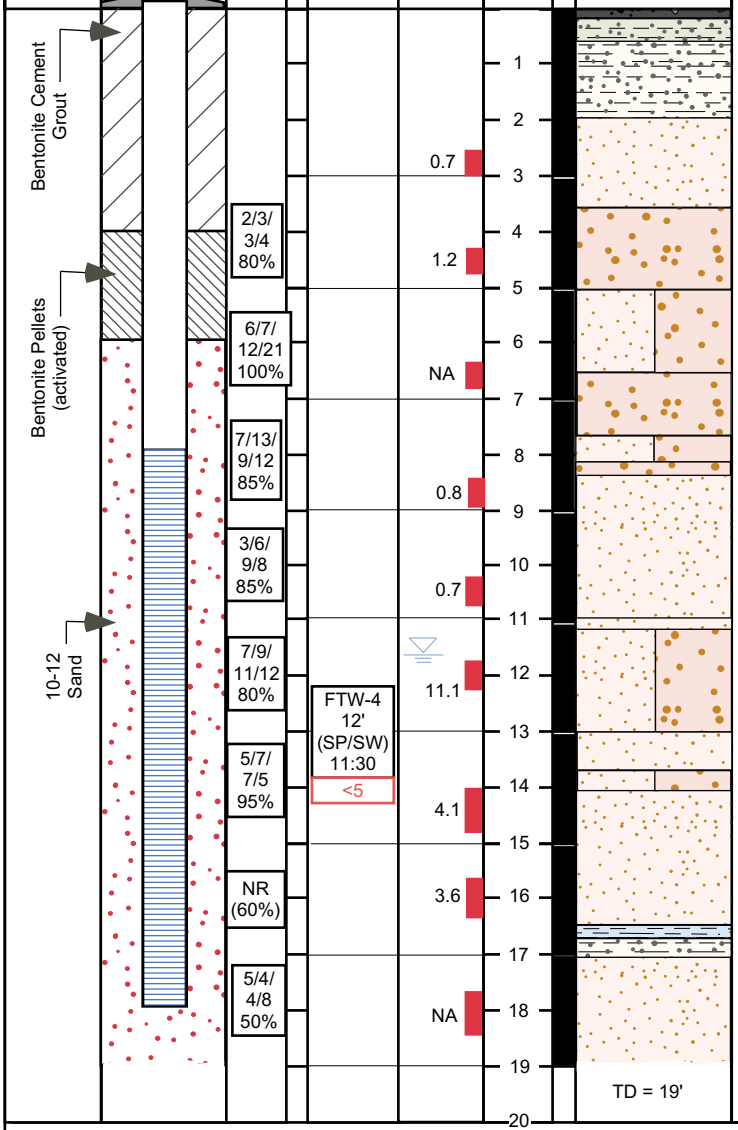
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **FTW-4**

DATE OF DRILLING: 02-02-01
LOGGED BY: W. Brown
DRILLER: H. Reichert/Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 3" Continuous Split Spoon/Posthole
TOP OF CASING ELEV: NA
DEPTH TO WATER: ~11.5'-12'
TOTAL DEPTH: 19'
CASING: 0-8' 2" Dia. Sched 40 PVC
SCREEN: 8'-18' 0.01 Slot 2" Dia. Sched 40 PVC
SURFACE COMPLETION: 8"X12" Manway withPad

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Hard packed dirt.
0.0'-0.5' (**SC**) Brown clayey sand, no odr.
0.5'-2.0' (**SM**) Silty sand, very fine to fine grained, slightly moist, no odor.
2.5'-3.0'+ (**SP**) Tan, well sorted fine to medium grained quartz sand.
3.0'-5.0' Split Spoon 1.6' sample. 0.0'-0.5' (**SP**) As above. 0.5'-1.6' (**SW**) Tan brown (**10YR**) Fine to coarse sand with ≤ 5% pebbles and gravel, unconsolidated, slightly moist, no apparent hydrocarbon odor.
5.0'-7.0' Split Spoon 2.0' sample. 0.0'-1.6' (**SP/SW**) Tan-brown (**10YR**) fine to medium sand with minor coarse sand and trace gravel, unconsolidated. 1.6'-2.0' (**SW**) As above.
7.0'-9.0' Split Spoon 1.7' sample. 0.0'-1.4' (**SW**) As above but with (**SW/GW**) gravel rich (~20%) zone from 0.8'-1.2'. 1.4'-1.7' (**SP**) Tan-brown (**10YR**) fine to medium sand, unconsolidated, no apparent hydrocarbon odor, slightly moist.
9.0'-11.0' Split Spoon 1.7' sample. 0.0'-1.7' (**SP**) Tan-brown fine to medium sand with localized silty intervals, unconsolidated, moist, no apparent hydrocarbon odor.
11.0'-13.0' Split Spoon 1.6' sample. 0.0'-0.4' (**SM**) an-brown (**10YR**) Silty very fine sand, very moist. 0.4'-1.6' (**SP/SW**) Medium sand with some fine and coarse sand component, water saturated, gray below 0.6' depth, weak hydrocarbon odor, unconsolidated.
13.0'-15.0' Split Spoon 1.9' sample. 0.0'-0.6' (**SP**) Light brown-gray fine to medium sand, unconsolidated, water saturated, slight hydrocarbon odor. 0.6'-1.0' (**SP/SW**) Fine to coarse sand. 1.0'-1.9' (**SP**) As above, no hydrocarbon odor.
15.0'-17.0' Split Spoon 1.2' sample. (**SP**) 0.0'-0.8' Light brown gray as above. 0.8'-1.0' Interbedded (**SM**) and (**CL**) stringers, plastic, trace hydrocarbon odor. 1.0'-1.2' (**SM**) Silty very fine to fine sand, trace hydrocarbon odor, unconsolidated, water saturated.
17.0'-19.0' Split Spoon 1.0' sample. 0.0'-1.0' (**SP**) Light gray-brown fine to medium grained sand.

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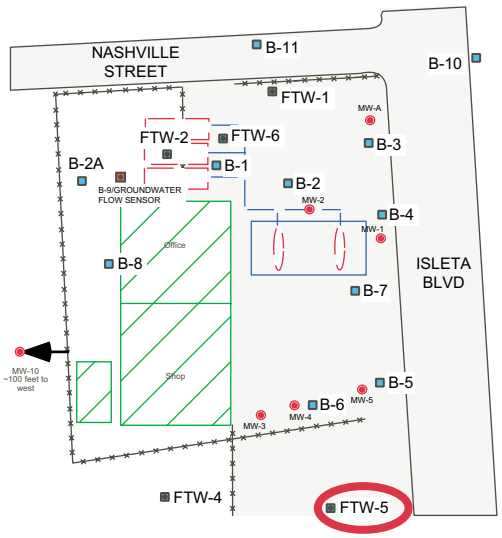
ONE SYCAMORE PLAZA, 5600 WYOMING BLVD, NE, ALBUQUERQUE, NEW MEXICO 87113
PHONE: (505) 293-1156 FAX: (505) 293-1971

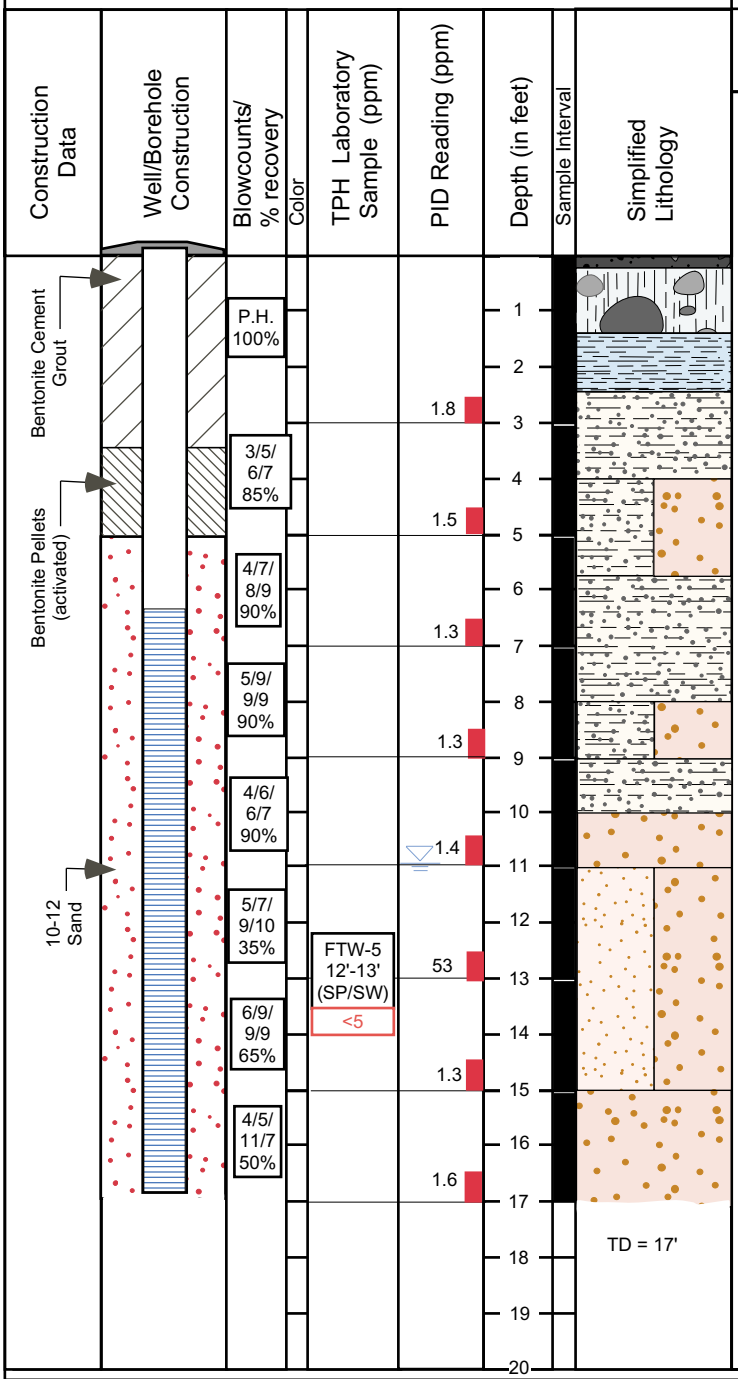
SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **FTW-5**

DATE OF DRILLING:	12-06-00
LOGGED BY:	S.Grietens
DRILLER:	H.Reichert/Rodgers
BOREHOLE DIAMETER:	8"
DRILLING METHOD:	Hollow Stem Auger
SAMPLING METHOD:	2" Dia. Continuous Split Spoon
TOP OF CASING ELEV:	NA
DEPTH TO WATER:	~11'
TOTAL DEPTH:	17.5'
CASING:	0-7' 2" Dia. Sched 40 PVC
SCREEN:	7'-17' 2" Dia. .01 Slot Sched 40 PVC
SURFACE COMPLETION:	8"X12 Manway with Concrete Pad

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION



Surface Conditions: Asphalt.
0.0'-3.0' Hand Auger (**GM**) (**10YR 3/3**) **100%** Silty gravel sand silt mixture, moist, no odor, gravel size fine to coarse (1.5"-3"), sand size fine to coarse. 1.5'-2.5' (**CL**) (**10YR 3/3**) Inorganic clay/silty with sand medium plasticity, moist, hard, no odor. 2.5'-3.0' (**SM**) Silty sand fine grain, soft, moist, no odor, (**5YR 4/6**) (**CL**)-nodules.
3.0'-5.0' Split Spoon (**5YR 4/6**) 1.75' sample. 0.0'-0.75' (**SM**) Fine grained silty sand, moist, soft, no odor. 0.75'-1.75' (**SM/SW**) Fine to coarse sands with some silt, moist, no odor.
5.0'-7.0' Split Spoon (**5YR 4/6**) 1.8' sample. 0.0'-0.8' (**SM/SW**) Fine to coarse sand with some silt, moist, no odor. 0.8'-1.8' (**SM**) Fine grained sand with some silt, moist, no odor, soft.
7.0'-9.0' Split Spoon (**5YR 4/6**) 1.8' sample. 0.0'-1.0' (**SM**) Fine grained sand with some silt, moist, soft, no odor. 1.0'-1.8' (**SM/SW**) Fine to coarse grain sand (1-2%) with some silt, moist, no odor.
9.0'-11.0' Split Spoon (**5YR 4/6**) 1.85' sample. 0.0'-0.8' (**SM**) Fine grained sand, some fines, some coarser sand <1%, slight odor, moist. 0.8'-1.85' (**SW**) Fine to coarse sands, some fines, slight odor, moist.
11.0'-13.0' Split Spoon (**SP/SW**) (**N5**) 0.7' sample. Poorly sorted sand with gravel (1/4"-3/4"), some fines, odor.
13.0'-15.0' Split Spoon (**SP/SW**) (**N5**) 1.3' sample. 0.0'-1.3' Same as (11.0'-13.0') above, poorly sorted, wet.
15.0'-17.0' Split Spoon (**SW**) (**N5**) 1.0' sample. 0.0'-1.0' Same as (11.0'-13.0') above, fine to coarse sand, little fines, poorly sorted, wet, gravel <10% 1/4"-3/4" in size

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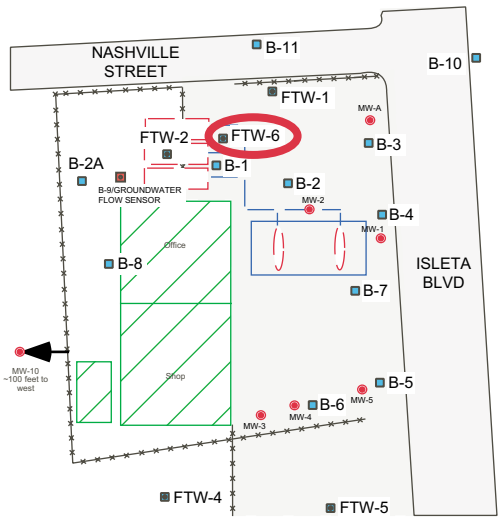
ONE SYCAMORE PLAZA, 5600 WYOMING BLVD, NE, ALBUQUERQUE, NEW MEXICO 87113
PHONE: (505) 293-1156 FAX: (505) 293-1971

SITE ID: **ISLETA-PHILS AUTO**
CLIENT: **BCEHD**
Well/Borehole ID: **FTW-6**

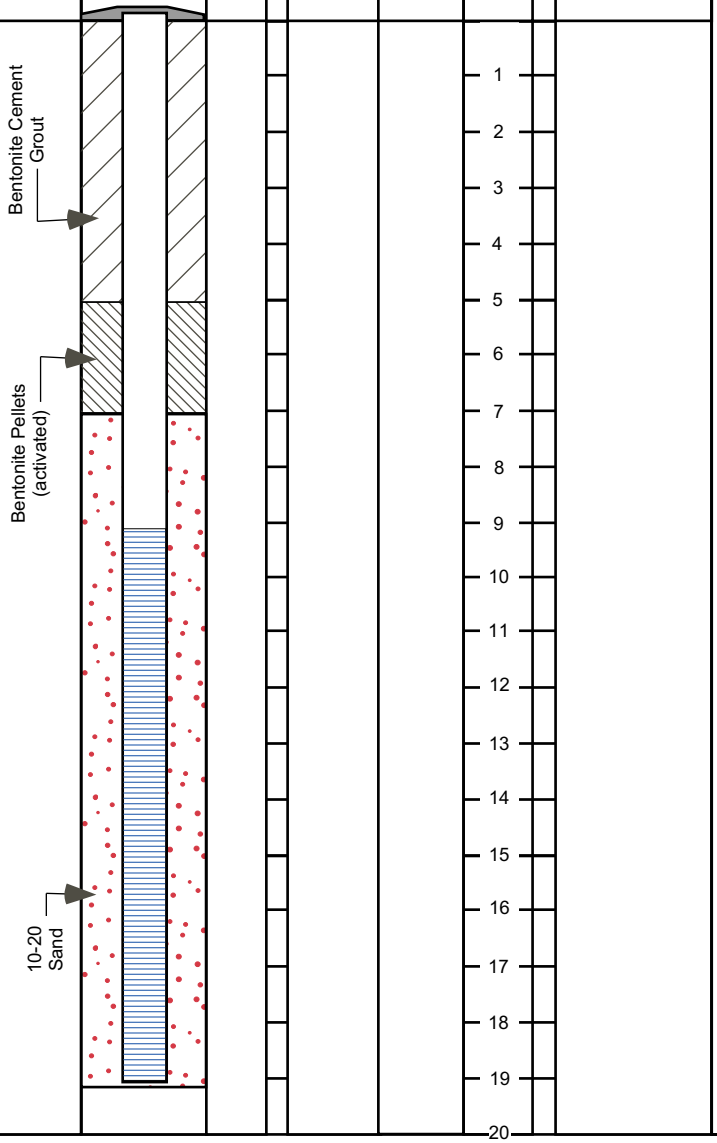
DATE OF DRILLING: 12-07-00
LOGGED BY: S.Grietens
DRILLER: H. Reichert/Rodgers
BOREHOLE DIAMETER: 8"
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: None
TOP OF CASING ELEV: NA
DEPTH TO WATER: ~12'
TOTAL DEPTH: 19'
CASING: 8.5' 2" Dia. 14' PVC
SCREEN: 10' .01 Slot 2" PVC
SURFACE COMPLETION: 8" Vault

BOREHOLE LOCATION



USCS - LITHOLOGIC DESCRIPTION

See adjacent log from borehole B-1



TECUMSEH PROFESSIONAL ASSOCIATES, INC.
ONE SYCAMORE PLAZA, 5600 WYOMING BLVD, NE, ALBUQUERQUE, NEW MEXICO 87113
PHONE: (505) 293-1156 FAX: (505) 293-1971

APPENDIX B

Laboratory Analytical Reports

APPENDIX C

Health and Safety Plan

FEI | Faith Engineering, Inc.

1000 Lomas Boulevard NW
Albuquerque, New Mexico 87102-1945
(505) 243-5494 • FAX (505) 243-5585

SITE HEALTH & SAFETY PLAN FOR THE PHIL'S AUTO SITE
701 ISLETA BLVD. SW, ALBUQUERQUE, NM
DRILLING AND MONITORING WELL INSTALLATION

SITE DESCRIPTION

Site Location: The site location is in the south valley of Albuquerque, New Mexico on Isleta Boulevard seven blocks south of Bridge Blvd.

Project Objective: Install soil borings and monitoring wells at a former gas station.

Site Description: The site is a former gasoline station that is presently occupied by an automotive service garage. No USTs presently exist at the site. No fuel dispensing is conducted.

PROJECT PERSONNEL

Project Team Leader:	William Brown
Scientific Advisor:	Stuart Faith
Site Safety Officer:	Tim Chavez
Public Information Officer:	Dave Strasser
Security Officer:	William Brown
Record Keeper:	Tim Chavez
Field Team Members:	Rob Sengebush and Rodgers Environmental Services Drilling Staff
State Agency Representative:	Tom Leck

All activities on-site must be cleared through the Project Team Leader.

ON-SITE CONTROL

William Brown is designated to coordinate access control and security on-site. The work zone perimeter will be established within a perimeter around the drill rig. No unauthorized person should be within the roped area.

HAZARD EVALUATION

The primary chemical hazard associated with the well installation is gasoline vapors. Gasoline is a mixture of several products. The primary constituents of concern and their associated hazards are identified below. Many of the hazards identified below are significantly small in quantity but should still be recognized as potential safety issues.

Substances Involved	Primary Hazards
Benzene	Extremely Flammable, Gives off Poisonous Vapor, Danger of Cumulative Health Effects
Toluene	Highly Flammable, Harmful Vapor
Xylenes	Harmful Vapor, Harmful by Skin Absorption, Flammable
1,2 Dichloroethane (EDB)	Highly Flammable, Harmful Vapor, Irritating to Skin, Eyes and Respiratory System
1,2 Dibromoethane (EDC)	Harmful Vapor, Toxic in Skin Contact
Ethylbenzene	Highly Flammable, Harmful Vapor, Irritating to Skin, Eyes and Respiratory System
Methyl Tert Butyl Ether (MTBE)	Extremely Flammable, Harmful Vapor, Irritating to Skin, Eyes and Respiratory System
Naphthalene	Moderately Flammable, Skin and Eye Irritant, Gastrointestinal Irritation

Hazardous Substance Information forms for these compounds are kept on file at the FEI office. They are available for review upon request.

Because of the chemical hazards associated with the gasoline vapors, no smoking or consumption of food and beverages will be permitted. The buddy system will be mandatory for personnel in the Work Zone at all times. If organic vapor levels exceed 300 ppm, respiratory protection will be required. Workers are cautioned to minimize skin contact routes of exposure.

Explosive vapors levels will be monitored as needed to insure worker safety. No open flames or ignition sources will be operated when explosivity levels exceed 1.5% in the Work Zone. No activities will take place in the Work Zone when explosive vapor levels exceed 15%.

The project scientist or safety officer will monitor all workers on the site for signs of heat stress and will ensure that adequate drinking water is available on-site. Workers that show signs of heat stress will immediately stop work, be placed in an air-conditioned vehicle and begin taking fluids. The worker's condition will be evaluated and evacuated for medical care as needed.

DRILLING EQUIPMENT HAZARD

The other site hazard is from mechanical drilling equipment. All non-essential personnel will keep a minimum distance of 50 feet away from the drilling equipment at all times. Hard-hats will be worn at all times when within the 50 foot radius. Steel toe boots and Level D protection are required during all drilling operations. New leather gloves will be worn when cutting core samples or handling exposed metal core ends. Safety glasses will be worn at all times during drilling, coring, or core cutting and extruding.

PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of the potential hazards, a Level D personal protection will be designated for the work zone.

Recommended equipment includes:

Coveralls / Long Sleeves and long pants (minimal skin exposure)
Safety boots/shoes

Optional equipment includes:

Hearing protection
Respiratory protection (half/full face respirators with solvent cartridges)

ENVIRONMENTAL MONITORING

The following environmental monitoring instruments shall be used on-site:
Combustible Gas Indicator to monitor flammable/explosive gas levels.
FID to monitor volatile organic vapor levels.
If monitoring indicates TLV levels exceed weighted averages, respiratory protection will be required in the affected areas.

EMERGENCY MEDICAL CARE

A person certified in first aid and CPR will be on-site during all work activities.
First aid equipment will be available on-site. A first aid kit will be in the FEI field vehicle.
Emergency telephone numbers:

Ambulance 911
Fire Dept. 911
Sheriff 911
Presbyterian Hospital Urgent Care Unit 462-7777

Hospital: Presbyterian Urgent Care Unit, 3436 Isleta Blvd.; Directions – south on Isleta Blvd. approximately 3.5 miles to Rio Bravo. Located on the northeast corner of Isleta and Rio Bravo. (See attached map) The Urgent Care Unit emergency entrance will be in front. Follow signs to emergency entrance. ALTERNATIVE: Call 911 for ambulance transport.

STANDARD TREATMENTS FOR CHEMICAL EXPOSURES ARE:

Splashes of the skin
1. Flood the splashed surface thoroughly with large quantities of running water for ten (10) minutes.
2. If the situation warrants it, arrange for transport to hospital. Provide information to hospital personnel about the chemical responsible and first aid treatment administered.

Splashes of the eye
1. Flood the eye thoroughly with large quantities of gently running water from tap or eye wash for ten (10) minutes.
2. Ensure the water bathes the eyeball by gently pressing open the eyelids and keeping them apart until treatment is completed.
3. Arrange transport to hospital and provide information to accompany casualty on the chemical responsible and first aid treatment administered.

Inhalation of gases
1. Ensure personal safety. Immediately remove the casualty out of danger area into fresh air.
2. If the casualty is unconscious, check breathing. If breathing has stopped, apply artificial respiration.
3. Arrange transport to hospital and provide information on compounds responsible and first aid treatment given.

Ingestion of poisonous chemicals
1. If the chemical has been confined to the mouth, give large quantities of water as a wash. Ensure mouth wash is not swallowed.
2. If the chemical has been swallowed, give copious drinks of water to dilute it in the stomach.
3. Do not induce vomiting.
4. Arrange for transport to the hospital. Provide information to accompany casualty on chemical swallowed and details of treatment given and possible estimate of the quantity and concentration of the chemical consumed.

EMERGENCY PROCEDURES (WILL BE MODIFIED AS REQUIRED FOR INCIDENT)

The following standard emergency procedures will be used by on-site personnel. The Site Safety Officer shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

Personal Injury in the Work Zone: Upon notification of an injury in the Work Zone, the designated emergency signal is a shout. All site personnel will move to the south side of Highway 66. The Site Safety Officer will evaluate the nature of the injury and select individuals to assist in moving the injured person to a safe area if possible. The appropriate first aid will be initiated by the Site Safety Officer. A designated individual will contact the ambulance service and hospital (if required). No persons will reenter the Work Zone until the cause of the injury or symptoms has been determined.

Fire / Explosion: Upon notification of fire or explosion on-site, the designated emergency signal is a shout. All site personnel will rapidly evacuate the site at a safe distance from the involved area. The fire department will be alerted and all personnel will remain at a safe distance until the situation is resolved.

Personal Protective Equipment Failure: If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person will immediately leave the Work Zone. Reentry will not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: If any other equipment on-site fails to operate properly, the Project Team Leader and the Site Safety Officer will be notified and then determine the effect of this failure on continuing operations on-site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel will leave the Work Zone until the situation is evaluated and appropriate actions taken.

The following emergency escape route is designated: south across Highway 66 to the nearest pay telephone. In all situations, when an on-site emergency results in evacuation of the Work Zone, personnel will not reenter until:

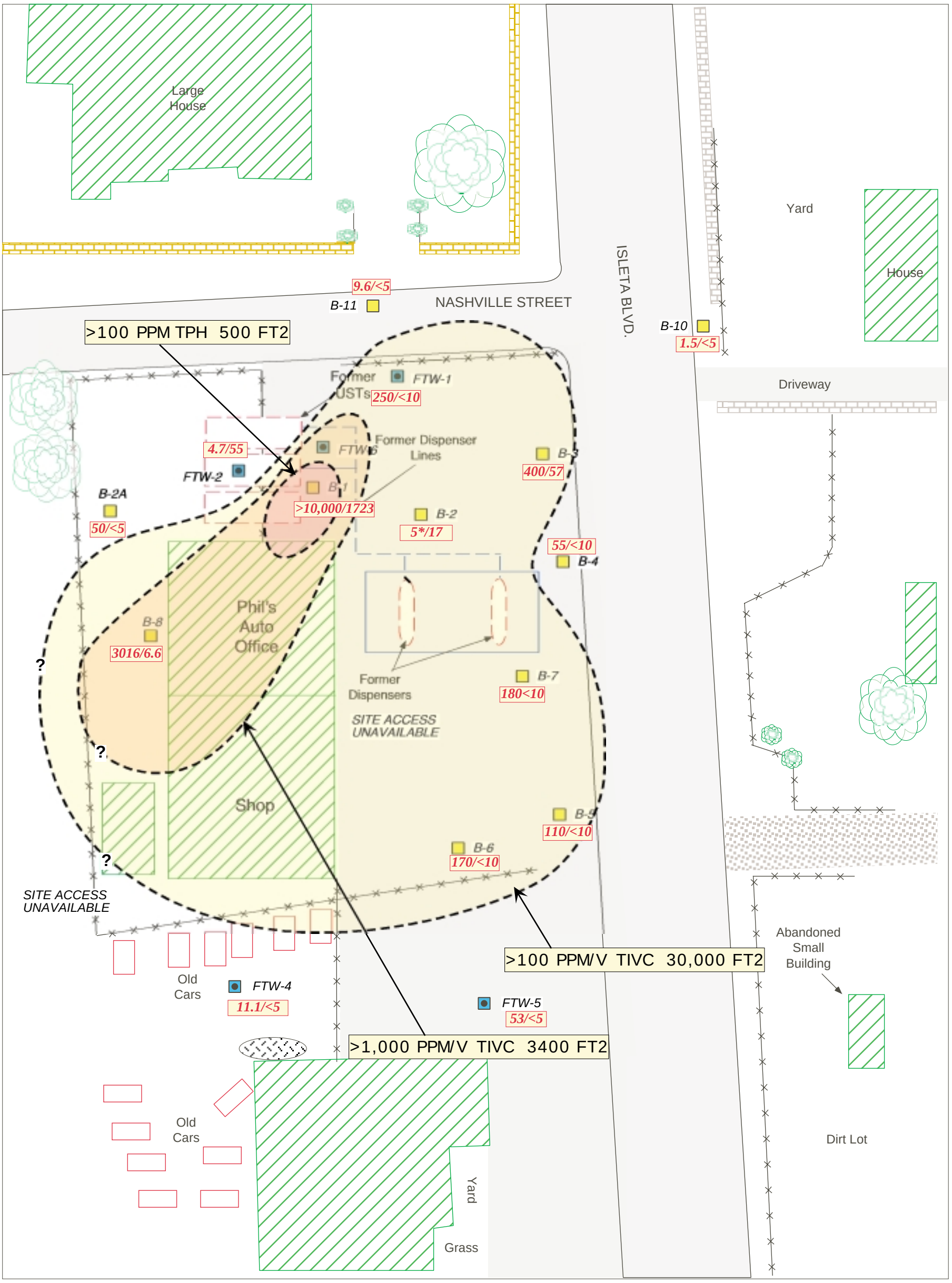
1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. Site Personnel have been briefed on any changes in the Site Safety Plan.

All site personnel have read the above plan and are familiar with its provisions.

	Name	Signature
Site Safety Officer:		
Project Team Leader:		
Other Site Personnel:		

APPENDIX D

Hydrocarbon Spill Mass Estimates



EXPLANATION

- New 2" Diameter Monitor Well
- New Soil Boring
- Maximum Soil Headspace Concentration (In parts per million/volume (ppm/v)). note* indicates sample not collected at water table
- 1100/230 — Maximum Soil Total Petroleum Hydrocarbons (TPH)Concentration (In parts per million (ppm))
- >100 PPM/V — Soil Headspace Isocontour (In ppm/v))
- >100 PPM — TPH gasoline range Isocontour (in ppm)
- Building
- Concrete
- Asphalt
- Vegetation
- Fence Line
- Utility Pole
- Manhole
- Fire Hydrant
- Adobe or Brick Wall

N

0 15 30ft
Scale

RESIDUAL SPILL MASS ESTIMATES

Phil's Auto Site
701 Isleta Blvd. SW, Albuquerque, New Mexico

FEI Faith Engineering, Inc.
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Base Drawn by: *ABL*/KGF/WJB	Project: 99-00-1183
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